INSTALLASJONSVEILEDNING
NAVIGATOR

PROGRAMVERSJON NAV-1.07

Juli 27, 2004

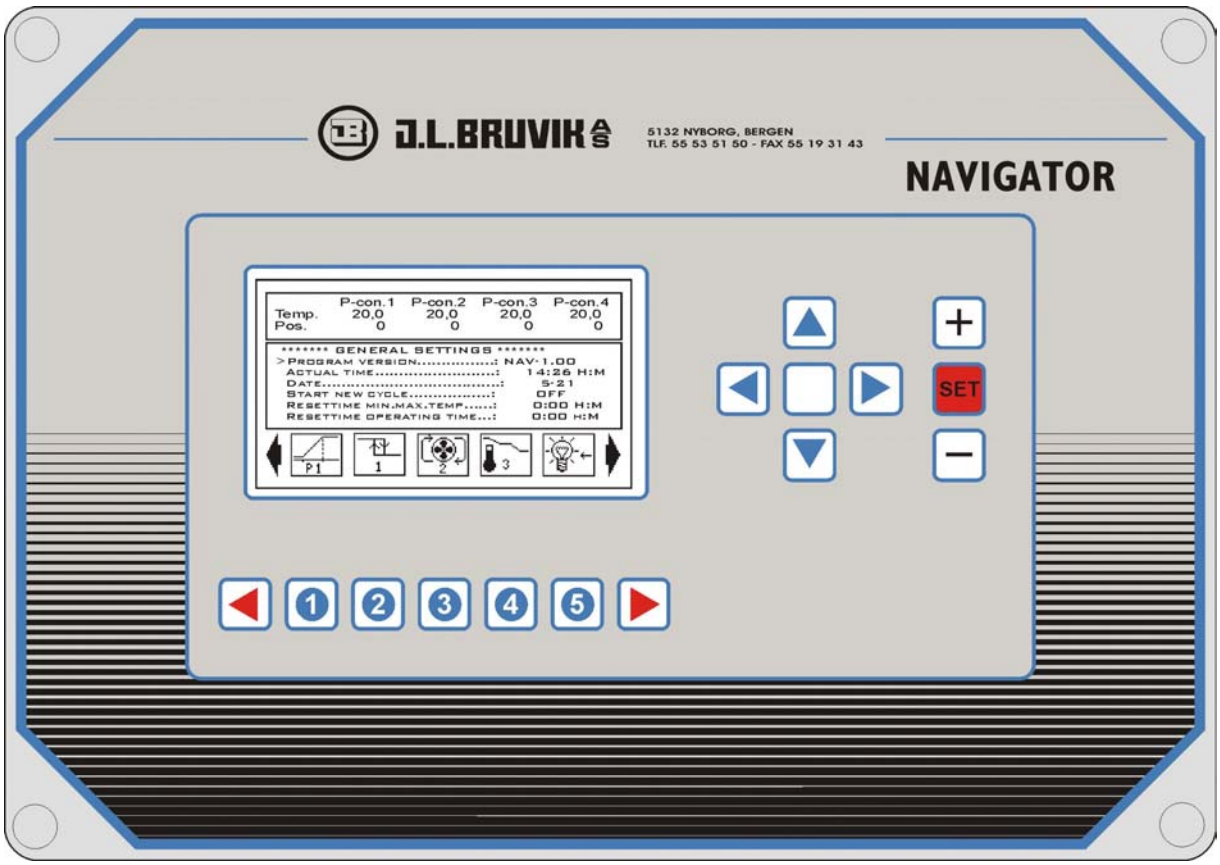


Table of contents

Dear customer,

This installer's manual contains all the necessary information to install the Navigator and adjust it to the user's wishes. Carefully read this manual before you enter your personal settings into the computer. Keep this manual at hand, so that you can use it as a reference book at all times.

As our products are subject to continuous development and updating, Van Issum Techniek BV is entitled to revise or modify its products without prior notice.

IMPORTANT!

It is of paramount importance to provide the installation with a sound alarm device. Van Issum Techniek BV recommends to check its proper functioning regularly (at least 1x a day)

Features of the installation program.

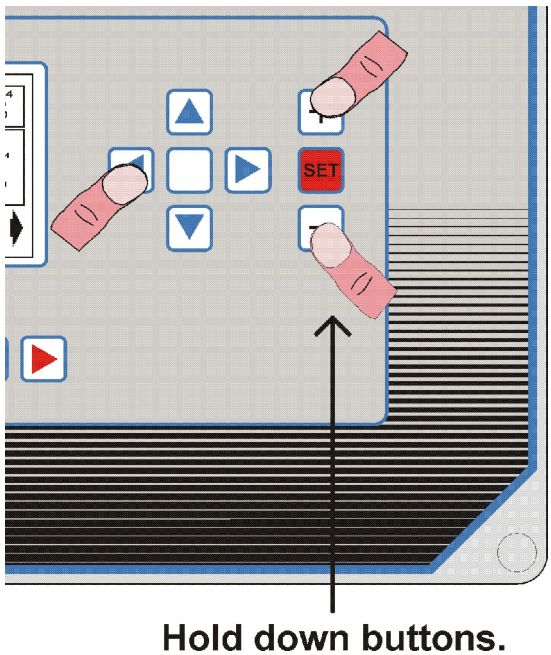
The installation program of the Navigator consists of 2 help programs: a test mode that allows you to test and adjust the various in- and outputs and an installer's program that enables you to assign the various sensors, inputs and outputs.

Test program.

Using the test program makes it possible to check all in- and outputs of the Navigator on their proper functioning. The analog inputs (such as e.g. temperature and 0-10V inputs) can be viewed directly. The various outputs (such as 4-20mA outputs and relays) can be controlled rightaway in order to check their functioning or e.g. to test a connected end station. The test program also allows you to adjust the analog outputs.

Starting up the test program.

You enter the test program as follows: press and hold down simultaneously cursor button =, the plus value and the minus value button, until the readout displays the text **===== TEST PROGRAM IS STARTED ======**. After that the push-buttons can be released and the test program is opened. *Note: in case you are not familiar with the operation of the Navigator you are referred to the corresponding chapters in the user's guide.*



Hold down buttons.

Using the function buttons the various test menus can be selected.

Menu: test relay outputs.

The test program first displays the menu that can be used to test the relays. You can also always enter this menu from another test program menu by pressing the function button  , after which the following functions will be displayed:

>Relay 1 (REL.1) . . . . . : OFF

Using this function relay 1 can be controlled directly. Pressing the plus value button makes the readout change from **OFF** to **ON**. Next you press the SET-button to confirm the setting, after which relay 1 will immediately be activated. Pressing the minus value button makes the readout change from **ON** to **OFF**. You press again the SET-button to confirm the setting and relay 1 will immediately be disconnected. *Note: the denomination in the function line, displayed between brackets (REL.1), corresponds with the indication on the board at the terminals of relay 1.*

The other relays can be controlled in the same way. Therefore their functions can do without further discussion. *Note: relays 1 to 8 inclusive are located on the basic bottom board. Relays A1 to A4 are located on the first extension board. (The extension board has a fixed connection to the basic bottom board) Relays B1 to B4 are located on the second extension board and relays C1 to C4 on the third extension board. In case not all extension boards are inserted, the functions concerning their relays will be void. For a ground plan of the bottom board and the extension boards you are referred to the corresponding chapter.*

Menu: test digital inputs.

This menu allows you to test all digital inputs. They are used e.g. for water counters, feed counters aso. You enter the menu by pressing function button  , after which the following functions will be available:

>Input 1 (DIG.GND/DIG.1) . . . . . : ON

Here the status of digital input 1 is displayed. If in the readout ON appears, the digital input is open. When the readout indicates OFF, the digital input is short-circuited with GND. In this case it regards the digital input on terminal DIG.1 and gnd on terminal DIG.GND. For a ground plan of the bottom board and the extension boards you are referred to the corresponding chapter. *Note: the input is always displayed with a delay time of a couple of seconds. In case a fast switching sensor is connected to the input, the readout will not be capable of following its measuring.*

The other digital inputs can be controlled in the same way and can therefore do without further discussion. *Note: digital inputs 1 to 8 inclusive are located on the basic bottom BOARD. Digital inputs A1 to A4 are located on the first extension board. (The extension board has a fixed connection to the basic bottom board). Digital inputs B1 to B4 are located on the second extension board and digital inputs C1 to C4 on the third extension board. In case not all extension boards are mounted, their corresponding functions will be void. For a ground plan of the bottom board and the extension boards you are referred to the corresponding chapter.*

Menu: test temperature sensors.

his menu displays, continuously, the measured temperature of the selected sensor. To enter the menu you press function button  .

After that the measurements of all the temperature inputs are available.

>Sensor 1 (SENS.1+/1-) . . . . . : 114.0 C

Now the temperature of sensor 1 is displayed continuously. The connections of sensor 1 are indicated in the function line (in this case SENS.1+ and SENS.1-) When there is no temperature sensor connected to this the readout will be void. *Note: only the sensor that is selected with the cursor buttons, will be measured continuously. The readout of the other sensors will not be adjusted.*

The other sensor inputs are all displayed in the same way.
Sensor 1 to 9: basic bottom board.
Sensor A1 to A4: first extension board (connected to basic board)
Sensor B1 to B4: second extension board.
Sensor C1 to C4: third extension board.
Note: in case not all the extension boards are mounted, their readings will be void.
Note: only the inputs that are defined as temperature inputs and have a temperature sensor connection will produce a reliable reading.
Note: the + and – indication on the function line refers to the positive and negative sensor terminal. Mind, however, that the temperature sensors, contrary to the humidity sensors, have NO polarity sensitivity and lack therefore a specific + and - terminal.

Menu: correction temperature sensors.

The temperature measuring of the Navigator can do without any calibration as the Navigator itself calibrates continuously. In order to compensate any deviations in temperature measurements caused by e.g. long sensor cabling, this menu allows you to set a correction factor for each individual sensor. You enter the menu by pressing function button  .
The following functions can be set:

>Sensor 1 (SENS.1+/1-) . . . . . : 0.0 C
This function can be used to adjust temperature sensor 1. If the temperature reading is too high, you enter a negative correction value. If it is too low, a positive correction is entered. Proceed as follows: determine the measured temperature with the help of the previous menu (test temperature sensors) and make a note of the measurement. Next you measure the exact temperature at the corresponding sensor. It goes without saying that you should apply a reliable precision thermometer. Reduce the temperature value measured by the thermometer by the temperature measured by the Navigator and enter the difference at the function.

The other sensors can be corrected in the same way and can, therefore do without further explanation.
Note: only temperature inputs can be corrected. So when the inputs are used for other purposes, as e.g. humidity measurement, it is no use to set a correction factor.

Menu: test volt inputs.

This menu tests the analog inputs that are used as 0-10V inputs. These inputs are used for humidity sensors. You open the menu by pressing function button  , after which the following measurements can be selected:

>Sensor 1 (SENS.1+/1-) . . . . . : 25 %
Here the measured voltage at input 1 is displayed in a percentage. 0% corresponds with 0 volt and 100% with 10 volt. This kind of input is used e.g. for humidity sensors, CO2 sensors aso. If the input is not used as a volt input, the reading will be void.
Note: only sensors that are selected by means of the cursor buttons will be measured continuously. The reading of the other sensors will not be adjusted.

The other inputs can be checked in the same way.
Note: in case not all the extension boards are mounted, their readouts will be void.
Note: only inputs that have been set as volt inputs will display a real reading.
Note: the + and – indication on the function line refers to the positive and negative terminal of the sensor. Ensure that the sensor is correctly connected to these terminals.

Menu: test analog outputs.

This menu allows you to control the analog outputs directly. The analog outputs are used to control stepless end stations. To enter the menu you press function button  , after which the following functions will be available:

>Output 1 (AN.GND/AN.1+) . . . . . : 50 %

The plus and minus value button can be used to set a percentage control value. After its entry you press the SET-button to send the value immediately to the corresponding output. This control value will then be maintained until a new value is entered and confirmed by the SET-button.
Note: the control value varies from 4 to 20mA or from 2 to 10 volt in case a voltage control has been chosen.

The other outputs can be tested in the same way.

Output 1 to 8:	basic bottom board.
Output A1 to A4:	first extension board (connected to basic board)
Output B1 to B4:	second extension board.
Output C1 to C4:	third extension board.

Note: in case not all the extension boards are mounted, their settings will have no effect.

Menu: adjustment analog outputs.

This menu can be used to adjust the analog outputs. You select the menu by pressing function button  .

Adjusting the analog outputs comes down to two important settings: the 4mA- and the 20mA adjustment. The Navigator uses these two settings to calculate all the different kinds of inputs. Next you define in the installer's program, if the output should operate under 0-20mA, 4-20mA, 20-0mA or 20-4mA.

>Min.outp.1 (AN.GND/AN.1+) . . . . : 171

Connect a precision mA-meter to analog output 1. (minus to AN.GND and plus to AN.1+, see outline connections) Use the plus and minus value buttons to adjust the output to that extent that the multimeter indicates **4.0mA**. *Note: the entered value does not affect the measured value. After verification of the display reading, the SET-button is pressed to memorize the setting. Do not forget this!*

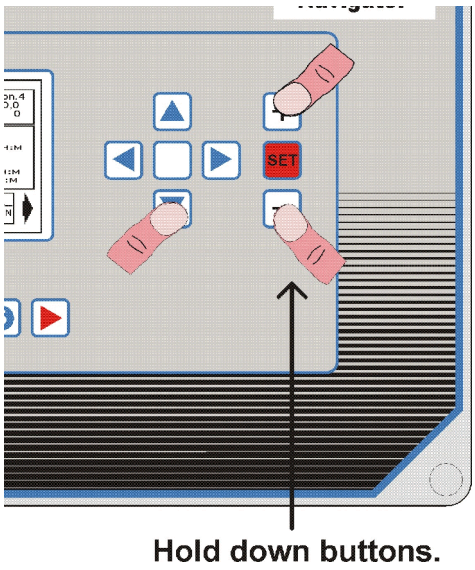
>Max.outp.1 (AN.GND/AN.1+) . . . . : 744

Connect a precision mA-meter to analog output 1. (minus to AN.GND and plus to AN.1+, see outline connections) Use the plus and minus value buttons to adjust the output to that extent that the multimeter indicates **20.0mA**. *Note: the entered value does not affect the measured value. After verification of the display reading, the SET-button is pressed to memorize the setting. Do not forget this.*

The following functions refer to the other analog outputs. Their adjustment is done in the same way and does not need to be discussed further.
Note: In case not all extension boards are mounted, the settings of the analog inputs that are not there will be void.

To exit the test program.

To exit the test program you proceed as follows: press and hold down simultaneously cursor button ?, the plus value button and the minus value button. After the display comes with the text **== USER'S PROGRAM IS STARTED ==** the buttons can be released. Then the test program will be terminated and the user's program will be started.

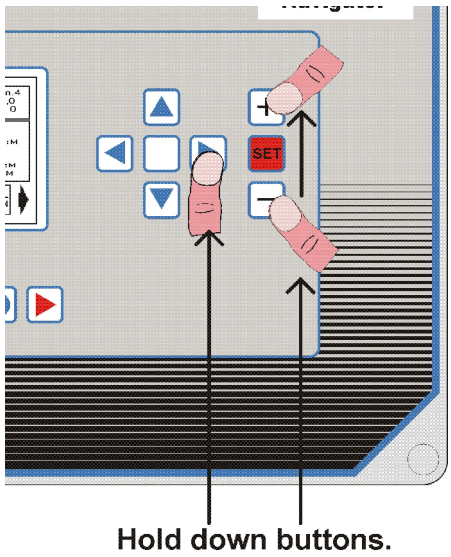


Installer's program.

The Navigator is provided with an installer's program by means of which all the assignments of sensors, inputs, outputs and the like can be set. The assignments are defined by the lay-out of the poultry house. The last pages of this manual show you a ground plan of such a barn, in which you can indicate the preferred location of sensors, ventilation controls, flap controls aso. You find there also a table in which you write your selected assignments. The same table can also be used when you are setting the assignments and when you will have to make some necessary changes later on.

Starting up the installer's program.

To start up the installer's program you proceed as follows: press and hold down the < cursor button, the plus value button and the minus value button simultaneously and wait till the display comes with the text **INSTALLER'S PROGRAM IS STARTED** . Then the buttons can be released and the installer's program will start up. See further on in the installer's manual.
Important: do not change any assignments if you are not for 100% sure of the operation of the settings you change. Bear in mind that the original configuration has proved its reliability and can be disturbed seriously by your changes.



In the installer's program the function buttons can be used to open the various menus.

Menu: general settings.

This menu accesses a number of general settings. After the installer's program has been started, the display automatically shows this menu first. If you, in the installer's program, want to enter the menu coming from another one, you will have to press function button  . The following settings will be displayed:

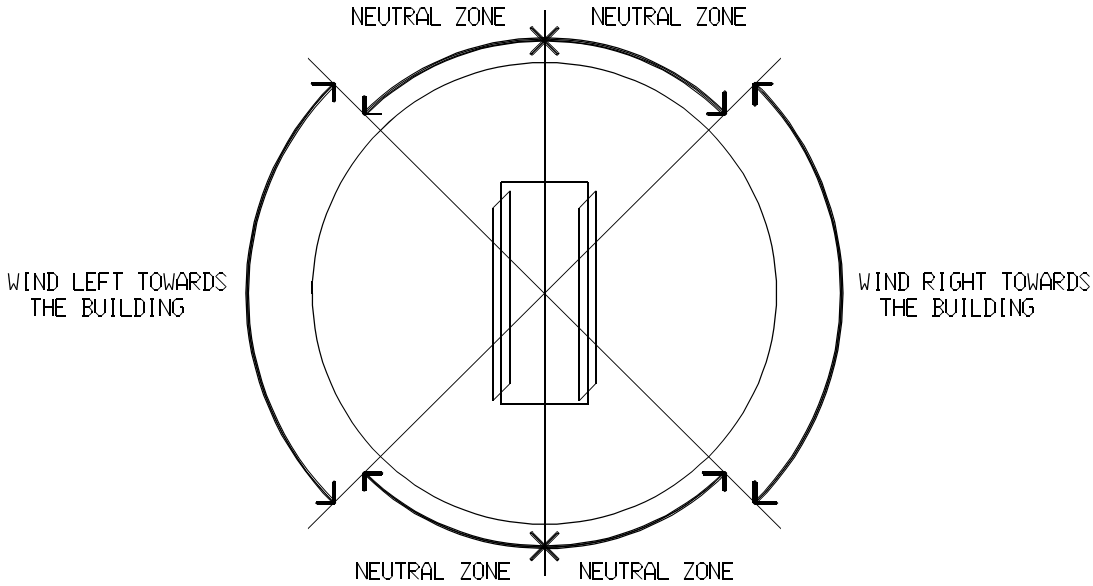
>Language setting . . . . . : 0

Here you select the language of your choice. A selection can be made from the following options:
0 = Dutch texts.
1 = English texts.
2 = Norwegian texts
3 = ……

Note: changing the language setting only comes to effect after you have exited the installer's program.

>Dead zone wind direction . . . . . : 20

The wind direction measuring can take 3 positions, i.e. a cross wind from the left towards the building, a lengthwise wind and a cross wind from the right. The function allows you to indicate the angle in degrees in which the wind direction is measured lengthwise across the building. See figure below.



>Hysteresis wind direction . . . . . : 10

This function indicates the number of degrees (of a circle) that will be taken as hysteresis to establish the wind direction. Example: in case the wind turns from lengthwise across the building to a cross wind from the left the wind direction will first have to turn back this hysteresis value before the direction lengthwise across the building will be adopted again. This prevents that the wind direction changes too often.

>Delay time wind direction . . . . . : 0:15 H:M

As wind direction and wind speed the average measurements during this time setting are taken. A low setting causes the measurements to be adjusted relatively fast, but they will have a turbulent character, whereas a longer time setting reduces this phenomenon.

>Litres/pulse water metering syst.1 . . . . : 1.00 l

This function counts the number of litres of water that will have to be added at each pulse emitted by the water counter. Default water counters apply 1 litre per pulse or 0.1 liter per pulse. But other values can also be set.

>Litres/pulse water metering syst.2 : 1.00 l

Identical to previous function, but now for water metering system 2.

>Kg/pulse feeding syst.1 . . . . . : 10.00 kg

This is the number of kilograms that will have to be added at each pulse emitted by the connected feed weigher.

>Kg/pulse feeding syst.2 : 10.00 kg

Identical to previous function, but now for feeding system 2.

>Reset offset start batch . . . . . : OFF

This function is used to define if the entered offset on the various temperature set points should be set at 0 at the start of a new batch. To start a new batch the corresponding function in the general settings menu of the user's program is put in the ON mode. Provided that the function 'reset offset start batch' is in the ON mode, all the offset values on the temperature set points will be set at 0. In the OFF mode the start of a new batch will not affect the offset setting.

>Fahrenheit readout . . . . . : OFF

This setting can be used to define whether the temperature should be displayed in Celsius or in Fahrenheit.
OFF = all readings in Celsius.
ON = all readings in Fahrenheit.

>DWS-20 for birds 1 . . . . . : OFF

This function is used to define if there is a DWS-20 birdweigher connected to the Navigator. (38400 baud, 7 data, 1 stop, even parity).
OFF = no DWS-20 connected. The settings of the birds has to be made on the Navigator.
ON = DWS-20 connected.
The menu's of the birds will be changed when a DWS-20 is connected. The settings of teh DWS-20 will be used, like number of birds and so on.

>DWS-20 for birds 2 . . . . . : OFF

Same as previous function, now for system 2. ***Remark:*** *the DWS-20 has to be adjusted for 2 departments*.

>Computer ID . . . . . : 0

Computer ID when the Navigator is connected to a local network/pc.

>Range pressure sensor . . . . . : 100 Pa

This function determines the maximum range of the used pressure sensor. If you use a pressure control, set this setting according the specifications of the pressure sensor.

Menu: activated functions.

The settings in this menu allow you to indicate which controls will be used. Controls that are not used will not be visible to user. To open the menu you press function button  .

The following functions will now be available:

>General outline . . . . . : ON

ON = the general outline in diagram of the poultry house can be accessed in the user's program. Note: the general outline must be created separately for each individual user. If not, it will probably not render a correct picture of the barn.
OFF = general outline not available to user.

>Bird menu 1 . . . . . : ON

Here you indicate if bird menu 1 has been activated. If not, this menu will not be visible to the user. *Note: the data in this bird menu is the same as in the water system menu and the feeding system menu.*

>Bird menu 2 . . . . . : ON

Identical to previous function, except now about bird menu 2.

>P-control 1 . . . . . : ON

Here you indicate if p-control 1 has been activated. If not, the control will not be visible to user.
(ON = p-control 1 activated, OFF = p-control 1 not activated) *Note: p-controls are used to govern stepless controls, such as air inlets, fans, stepless heating units aso.*

The other 19 p-controls can be selected in the same way. They can therefore do without further explanation.

>On/off control 1 . . . . . : ON

Here you indicate if on/off control 1 has been activated. If not, the control will not be visible to user. (ON = on/off control 1 activated, OFF = on/off control 1 not activated) Note: on/off controls are used to switch on or off e.g. a heating unit, a fan aso. on the basis of temperature.

The other 19 on/off controls can be selected in the same way. They can therefore do without further explanation.

>Feeding system 1 . . . . . : ON
This function is used to define the presence of feeding system 1. A feed circuit is connected on the basis of time and if desired disconnected again on the basis of weight or time.

>Feeding system 2 . . . . . : OFF
This function is used to define the presence of feeding system 2. See also previous function.

>Feed weigher . . . . . : OFF
This function is used to define the presence of a feed weigher connected to the Navigator.

>Water metering system 1 . . . . . : ON
This function is used to define the presence of water metering system 1. A water metering circuit is connected on preset times and, subject to its setting, disconnected again on a preset litre counting or operation time.

>Water metering system 2 . . . . . : OFF
Identical to previous function, but now for water metering system 2.

>Lighting system 1 . . . . . : ON
This setting defines the presence of light control 1. The lighting is switched on and off on preset times and, if required, stepless so that artificial sun rise and sun set can be simulated.

>Lighting system 2 . . . . . OFF
Identical to previous function, but now for light control 2.

>Timer control 1 . . . . . : ON
Here you define the use of an additional timer control. The additional timer control can be used for time controlled connection and disconnection of various matters. Another option is a pulse/pause control during the period of engagement.

>Timer control 2 . . . . . : OFF
Identical to previous function, but now for additional timer control 2.

>Humidity control . . . . . : ON
This setting indicates the use of a humidity control. If not, the menu of the humidity control will not be visible to user. The humidity control can be used to monitor the humidity in the poultry house. The control has the possibility to affect the p-controls and/or on/off controls so as to regulate the indoor humidity.

>CO2 control . . . . . : OFF
Here you define the presence of a CO2 control. The CO2 control can be applied to affect the p-controls and/or the on/off controls to such extent that the CO2 content in the barn will be reduced.

>Wind control . . . . . : OFF
Here you indicate if you make use of the wind control. The wind control may affect the p-control. The p-controls are reduced on the basis of the wind direction and the wind speed, as a result of which the influence of the wind is reduced. All to be set by the user himself.

>Temperature curve 1 . . . . . : ON
This setting defines the presence of general temperature curve 1. The user can so to speak 'couple' the p-controls and/or the on/off controls to this general curve, which makes it possible to have the temperature set points of the controls defined by the general curve. In this way you can set the entire barn on the required temperature using only a single temperature set point (= the general curve).

>Temperature curve 2 . . . . . : OFF
Identical to previous function, but now for general temperature curve 2.

>Temperature curve 3 . . . . . : OFF
Identical to previous function, but now for general temperature curve 3.

>Temperature curve 4 . . . . . : OFF
Identical to previous function, but now for general temperature curve 4.

>Circulation control 1 . . . . . : OFF
This setting indicates the activation or deactivation of circulation control 1. The circulation control can be used to cope with the temperature differences in the barn. The moment the temperature differences become too large the circulation fans will be switched on to reduce the difference.

>Circulation control 2 . . . . . : OFF
Identical to previous function, but now for circulation control 2.

>Boiler control . . . . . : OFF
This function can be used to define whether the boiler control is activated or not. The boiler control can control up to 3 boilers connected in cascade, if necessary, together with their pumps. Their control can be set e.g. at heat demand.

>Stage ventilation 1 . . . . . : OFF
Using this function allows you to activate or deactivate the presence of stage ventilatie 1. Stage ventilation is applied to add fans on the basis of temperature. A p-control provides its stepless regulation.

>Stage ventilation 2 . . . . . : OFF
Identical to previous function, but now for stage ventilation 2.

>Pressure control . . . . . : OFF
If you use a pressure control, set this function to ON.

Menu: sensor selection.

Using the settings in this menu you can define the analog inputs. To open the menu you press function button 

. The following settings will be displayed:

>Sensor 1 (SENS.1+/1-) . . . . . : TEMP
This setting indicates what type of sensor is connected to analog input 1. There are 3 possibilities:
NO = the sensor input is out of use and therefore no sensor is to be connected.
TEMP = the sensor input is used as temperature input. The corresponding jumper must be put in the correct position. See jumper positions analog inputs.
VOLT = the sensor input is used as 0-10 volt input. It can be a humidity sensor, a CO2 sensor or the wind direction. The corresponding jumper must be put in the correct position. See jumper positions analog inputs.

The explaining text in the display reproduces the connection numbers between brackets. Their names correspond with those mentioned on the bottom board. The other functions relate to analog inputs 2 to 21 inclusive and are identical, as for their settings, to sensor input 1. The functions can, therefore, do without further explanation.

Menu: assignment sensors.

In this menu you indicate which sensors are used for the various controls. To open the menu you press function button  . *Note: to some controls only a maximum of 4 sensors can be assigned. The control will then take the average measured value of them all.*

>Outdoor sensor . . . . . : SENS. 1

This setting indicates which sensor input is being used to measure the outdoor temperature. A choice can be made from the following options:
NO = no sensor selected.
SENS.1 to **SENS.9** = sensor input 1...9 selected. These sensor inputs 1 to 9 are located on the basic bottom board.
SENS.A1 to **SENS.A4** = sensor input A1 ... A4 selected. These inputs are located on the first extension board. It has a fixed connection to the bottom board.
SENS.B1 to **SENS.B4** = sensor input B1 ... B4 selected. These inputs are located on the second extension board.
SENS.C1 to **SENS.C4** = sensor input C1 ... C4 selected. These inputs are located on the third extension board.
Note: In case not all extension boards are mounted, the sensor inputs for those extension boards can of course not be used.

>Sensor p-ctrl1 . . . . . :SENS. 2

Here you define which sensor input is to be used for p-control 1. See also previous function. This function is repeated 3 times, so that a maximum of 4 sensors can be assigned to p-control 1. If you are not going to assign them all 4, you set the void ones at NO. A p-control will always use the average measured value of the assigned sensors for temperature measuring.
Note: ensure that the sensor inputs you assign to the p-control, have also been actually set as temperature inputs.
Note: do not assign any sensors to p-controls that are not going to be used, but set them at NO.

>Sensor p-ctrl2 . . . . . :SENS.2

Identical to previous function, but now for p-control 2.

For p-controls 3 to 20 applies that they can have their sensors assigned in the same way. They can, therefore, do without further discussion.

>Sensor on/off 1 . . . . . :SENS. 2

Here you define the sensor inputs for on/off control 1. This function too appears 4 times, so that a maximum of 4 sensors can be assigned to a single on/off control. Here too applies the same as mentioned at the previous function.

For on/off controls 2 to 20 applies that they can have their sensors assigned in the same way. They can, therefore, do without further discussion.

>Sensor indoor humidity . . . . . :SENS. 6

Here you indicate which sensor input will be assigned to humidity measuring, that is to say for the indoor humidity. *Note: ensure that the sensor input is set as a VOLT input. For a humidity sensor a sensor must be used with a voltage signal of 0-10V (0-100%)*

>Sensor outdoor humidity . . . . . :SENS. 7

Identical to previous function, but now to measure the air humidity outside.

>Sensor indoor temperature . . . . . :SENS. 2

This function appears 4 times. Here you set the sensor inputs that must be used to establish the average indoor temperature. This average temperature is being used by the humidity control to establish the temperature difference between inside and outside. On the basis of this differential the Navigator defines how the air humidity in the barn is going to react when outside air is sucked in and gets into touch with the indoor temperature.

>Sensor CO2 . . . . . : NO

This setting defines which sensor will be used by the CO2 control. **Note: ensure that the sensor input is set as a VOLT input. The CO2 sensor should emit a voltage signal of 0 - 10 Volt (0 – 1.00%).**

>Sensor wind direction . . . . . : NO

Making use of a weather station (wind control being activated), this sensor input will be used to establish the wind direction. *Note: ensure that the sensor input is set as a VOLT input.*

>Sensor circulation 1 . . . . . :SENS. 2

This function defines the sensor input to be used for the circulation control. This function too appears 4 times, so that a maximum of 4 sensor inputs can be assigned to the circulation control. The Navigator continually defines the temperature difference between the highest and lowest measured temperature of the sensors. Ensure therefore to assign at least 2 sensors, so as to make it possible to define a differential. The assignment of a single sensor causes the measured temperature difference always to be 0.0C/. *Note: ensure that the sensor input is set as a TEMP input.*

>Sensor circulation 2 . . . . . : NO

Identical to previous function, but now for circulation control 2.

>Sensor boiler . . . . . : NO

If the boiler control has been activated, you select here the sensor input to be used to measure the boiler water temperature. *Note: ensure that the sensor input is set as a TEMP input.*

>Sensor weigher . . . . . : NO

When there is a feed weigher connected to the Navigator, you have to select the input used for the weight signal. ***Remark****: this input as to be configured as a 0-10V input.*

>Sensor pressure . . . . . : NO

If you have connected a pressure sensor, you have to set this function to the according input. ***Remark****: this input as to be configured as a 0-10V input.*

Menu: mode analog outputs.

This menu allows you to select the various output signals of the analog outputs. The analog outputs are controlled by an assigned p-control and are applied to govern stepless end stations. To open the menu you press function button  , after which the following functions will be available:

>Output 1 (AN.GND/AN.1+) . . . . . : 4-20 mA

This function is used to select the controlling way of analog output 1. A selection can be made from the following options:
4-20mA: At 0% control: 4mA output signal. At 100% control: 20mA output signal.
0-20mA: At 0% control: 0mA output signal. At 100% control: 20mA output signal.
20-4mA: At 0% control: 20mA output signal. At 100% control: 4mA output signal.
20-0mA: At 0% control: 20mA output signal. At 100% control: 0mA output signal.
Note: the denomination of the connections in the text line is indicated between brackets. The names correspond with the indications on the board.
Note: here all the time one speaks of mA control (so-called current source driving) If however voltage control is required, a jumper can be used to set it. See for this the appropriate chapter 'jumper positions output signals'. The output signals will be inverted as follows:
4-20mA becomes 2-10V.
0-20mA becomes 0-10V.
20-4mA becomes 10-2V.
20-0mA becomes 10-0V.

The other outputs 2 to 20 can be set in the same way and will therefore not be mentioned further.

Menu: mode p-controls

The functions in this menu allow you to define whether a p-control should work as cooling or as heating. The menu is selected by pressing function button 

, after which the following functions can be set:

>P-control 1 . . . . . : COOLING

This function defines whether p-control 1 will have to act as cooling (or ventilation) or as heating.
COOLING = the p-control acts as cooling, which implies that the control signal increases with a rising temperature. Example: the ventilation level increases when the house temperature exceeds the temperature set point.
HEATING = the p-control acts as heating. Now the control signal will increase with a falling temperature. Example: the heating control increases as it gets colder.

The other p-controls can be set in the same way. *Note: As for p-controls that are not used (are not activated) it will be no use to enter a setting.*

Menu: assignment analog outputs.

This menu allows you to assign the outputs to the various stepless controls. To each control up to 4 outputs can be assigned. Assigning an output to more than one stepless control, their control signals will be counted up and sent to the selected output. In this way it will be possible to combine a number of controls. By pressing function button 

the menu opens with the following functions:

>P-control 1 . . . . . : AN.1

This setting occurs 4 times, which means that a maximum 4 outputs can be connected to this control.
The following outputs can be selected:
NO = no selection of outputs.
AN.1 t/m **AN.8** = analog outputs on bottom board.
AN.A1 to **AN.A4** = analog outputs on extension board 1.
AN.B1 to **AN.B4** = analog outputs on extension board 2.
AN.C1 to **AN.C4** = analog outputs on extension board 3.
STAGEV.1 or **STAGEV.2** = the signal of p-control 1 is now passed on to stage ventilation 1 or 2.
REL.1 to **REL.8** = control signal of p-control 1 is passed on to a relay on the bottom board. This relay will then be controlled as a pulse/pause relay. The ratio between pulse and pause will then be defined by the p-control.
REL.A1 to **REL.A4** = control signal to relay on extension board 1.
REL.B1 to **REL.B4** = control signal to relay on extension board 2.
REL.C1 to **REL.C4** = control signal to relay on extension board 3.
Note: more than one control can be assigned to a single output. Their controls will then be counted up and added to appropriate output.
Note: assigning an output to a p-control that is not there will have no effect.

The other p-controls may be set in the same way. They can, therefore, do without further explanation.

>Lighting system 1 . . . . . : AN.8

Here you define which output must be controlled by the lighting system. See further the explanation at previous function. The lighting system too can control up to 4 outputs, so that the function appears 4 times.

>Lighting system 2 . . . . . : NO

Identical to previous function, but now for lighting system 2.

>Circulation control 1 . . . . . : NO

Here you define the output that must be regulated by the circulation control. See further the explanation at the previous functions.

>Circulation control 2 . . . . . : NO
Same as previous function, but now for circulation control 2.

>Stage ventilation 1 . . . . . : AN.4
The stage ventilation receives its control signal from a p-control to which it is connected. (Consult also the assignment of analog outputs - p-controls) The stage ventilation then inverts this control signal to a stepless signal and to a maximum of 6 relays to add the ventilation groups. This function indicates which output is used by the stage ventilation for stepless control. See commentary at the assignment to p-control 1.

>Stage ventilation 2 . . . . . : NO
Same as previous function, but now for stage ventilation 2.

Menu: assignment relays.

This menu allows you to assign the relays to the various controls. To open the menu you press function button  .

>On/off control 1 . . . . . : REL.1
Here you define which relay must be regulated by on/off control 1.
Note: mind that each relay will be connected to a control only once!
Note: If an on/off control is not active, assignment of a relay to such a control has no effect.

The other on/off controls are connected to a relay in the same way.

>Feeding system 1 . . . . . : NO
Here you define which relay is used by the feeding system to activate the feeding installation.

>Feeding system 2 . . . . . : NO
Same as previous function, but now for feeding system 2.

>Water metering system 1 . . . . . : REL.8
This setting indicates which relay is used to switch on the water supply.

>Water metering system 2 . . . . . : NO
Same as previous function, but now for water metering system 2.

>Lighting system 1 . . . . . : REL.A-1
This is the relay that switches on and off the lighting after the time table of the light control.

>Delayed light 1 . . . . . : REL.A-2
This output is switched on simultaneously with the relay of the previous function. However, after disconnection of the lighting system this relay will stay connected a preset time before its final disconnection.

>Lighting system 2 . . . . . : NO
Same as the function of lighting system 1, but now for lighting system 2.

>Delayed light 2 . . . . . : NO
Same as the function of lighting system 1, but now for lighting system 2.

>Circulation control 1 . . . . . : NO
Basically the circulation control is an analog control. If, however, a relay is connected to this control, the relay will be opened the moment the control signal of the circulation control drops to 0%. It can be applied to completely disconnect a stepless controllable end station, when no circulation is necessary.

>Circulation control 2 . . . . . : NO
Same as previous function, but now for circulation control 2.

>Timer control 1 . . . . . : NO
Here you define the relay to be used for the additional timer control.

>Timer control 2 . . . . . : NO
Same as previous function, but now for additional timer control 2.

>Humidity control . . . . . : REL.7
The humidity control too has a relay at its disposal. It offers the possibility to switch on a humidifier the moment the humidity drops below a preset level.

>Boiler control 1 . . . . . : NO
The Navigator is equipped with a boiler control that can regulate up to 3 boilers connected in cascade. You set here which relay will be used to connect and disconnect boiler 1.

>Boiler control 2 . . . . . : NO
Same as previous setting, but now for boiler 2.

>Boiler control 3 . . . . . : NO
Same as previous function, but now for boiler 3.

>Pump boiler 1 . . . . . : NO
The boiler control also offers the possibility to govern a circulation pump for each individual boiler. The pump will be switched on simultaneously with the boiler and after disconnection of the boiler will stay connected a preset post-operation time in order to get rid of the rest heat. The setting defines which relay is used to control the pump of boiler 1.

>Pump boiler 2 . . . . . : NO
Same as previous function, but now for the pump of boiler 2.

>Pump boiler 3 . . . . . : NO
Same as previous function, but now for the pump of boiler 3.

>Stage ventilation 1 (st.1) . . . . . : REL.B-1
The stage ventilation receives its control signal from a p-control to which it is connected. The stage ventilation inverts this control signal to a stepless signal (see assignment analog outputs) and to a maximum of 6 relays to add the ventilation groups. This function is used to define which relay must be used to activate ventilation group 1.

>Stage ventilation 1 (st.2) . . . . . : REL.B-2
See previous function, but now to activate ventilation group 2.

>Stage ventilation 1 (st.3) . . . . . : REL.B-3
See previous function, but now to activate ventilation group 3.

>Stage ventilation 1 (st.4) . . . . . : REL.B-4
See previous function, but now to activate ventilation group 4.

>Stage ventilation 1 (st.5) . . . . . : NO
See previous function, but now to activate ventilation group 5.

>Stage ventilation 1 (st.6) . . . . . : NO
See previous function, but now to activate ventilation group 6.

The 6 outputs of stage ventilation 2 can be connected to relays in the same way. It will here be dealt with further.

>Silo 1 . . . . . : NO
If you use a feed weigher connected to the Navigator, you can select which relay is controlling the auger of silo 1.

>Silo 2 . . . . . : NO
Like previous function, but now for silo 2. If you don't have a silo 2, adjust this setting to NO.

>Silo 3 . . . . . : NO
Like previous function, but now for silo 3. If you don't have a silo 3, adjust this setting to NO.

>Silo 4 . . . . . : NO
Like previous function, but now for silo 4. If you don't have a silo 4, adjust this setting to NO.

>Mixer . . . . . : NO
If the weigher is equipped with a mixer, select the relay that is controlling the mixer.

>Feed transport 1 . . . . . : NO
The feed weigher of the Navigator can control a maximum of 6 feed transport circuits. These circuits transports the feed from the weigher to the feeding system in the barn. This function is used to select the relay that controls the feed transport circuit 1.

>Feed transport 2 . . . . . : NO
Like previous function, but now for feed transport 2.

>Feed transport 3 . . . . . : NO
Like previous function, but now for feed transport 3.

>Feed transport 4 . . . . . : NO
Like previous function, but now for feed transport 4.

>Feed transport 5 . . . . . : NO
Like previous function, but now for feed transport 5.

>Feed transport 6 . . . . . : NO
Like previous function, but now for feed transport 6.

>Feed weigher valve . . . . . : NO
The feed weigher has a valve which is used for emptying the weigher. This function is used to determine the relay for controlling this valve.

Menu: analog pwm control for relays

The Navigator can assign relays to stepless p-controls. These relays will be regulated in a pulse/pause rhythm then. The regulation of the p-control defines the proportion between the time of engagement and the total operation time of the pwm relay. You enter the menu by pressing the  function button.

>Operation time relay 1 . . . . . : 1:00 M:S
Stands for the operation time (or repetition time) of relay 1. Dependent on the control signal emitted by the connected p-control, the relay will be closed during a particular time of this operation time.

>Min.on/off-time rel.1 . . . . . : 0:10 M:S
When the control signal of the pwm relay is 0%, the relay is continuously open. When the control signal increases, the relay will be activated a part of the operation time. However, if the calculated percentage

on-switch time is smaller than this minimum time setting, the minimum time will be taken. But if the calculated on-switch time has been taken so large that the off-time gets smaller than the minimum on/off time setting, the relay will be activated continuously. This is important to prevent the relay from being switched on and off during very short periods of time.
Example: The operation time is set at 1 minute and the minimum on/off time is 10 seconds.
At a control signal of 0% the relay will be switched off continuously.
At a control signal of 1% the calculated on-switch time is 0.6 seconds. As this time is smaller than the minimum on-time setting, the duration of engagement of the relay will be 10 seconds followed by a pause of 50 seconds.
At a control of 25% the calculated on-switch time is 15 seconds and the off-switch time 45 seconds.
At a control of 50% the calculated on-switch time is 30 seconds and the off-switch time also 30 seconds.
At a control of 90% the calculated on-switch time will be 54 seconds and the calculated off-switch time 6 seconds. As these 6 seconds are again smaller than the minimum off-time of 10 seconds, the relay will be activated continuously.
At 100% control the relay will of course also be activated 100% of the operation time.
Note: making the minimum on/off time the same as the operation time setting, you will get a relay control that is deactivated at 0% control and activated continuously at a control of 1-100%. The pwm relay control will then be changed into a normal on/off control.

The following functions are identical to the previous ones, but now it relates to the pwm settings of the other relays.
Note: In case the relays have not been assigned to a p-control and are therefore not used as pwm relay controls the relay settings will have no effect.

Menu: assignment digital inputs.

This menu allows you to select the digital inputs to be used as input for the various controls. You enter the menu by pressing function button 

>Feeding system 1 . . . . . : DIG.1
Here you define which digital input must be used as feed counter input for feeding system 1. All the digital inputs can be used as inputs: DIG.1 to DIG.8 on the basic bottom board, DIG.A1 to DIG.C4 on the various extension boards. Note: if, I n the installer's program, feeding system 1 is not activated, this assignment will have no effect.

>Feeding system 2 . . . . . : NO
Same as previous function, but now for feeding system 2.

>Water metering system 1 . . . . . : NO
Same as previous function, but now for water metering system 1.

>Water metering system 2 . . . . . : NO
Same as previous function, but now for water metering system 2.

>Wind speed . . . . . : DIG.3
Making use of a weather station the wind speed measuring is connected to this digital input.

>Empty sensor weigher . . . . . : NO
The feed weigher has a empty sensor inside the weigher. With help of this sensor the Navigator can determine whether the weigher is empty or not. When the sensor signals ''empty'' the weigher can make a new portion. This function selects which digital input is used for the empty sensor. ***Remark****: if the digital input is connected to GND by the empty sensor the weigher should be empty.*

>Empty sensor feed transport 1 . . : NO

With help of this empty sensor in the feed transport circuit (this is the transport of feed from the weigher to the feeding system in the barn) the Navigator determines if there is a demand of feed in the concerning circuit. Here you can select the digital input for this empty sensor. ***Remark**: if the digital input is connected to GND by the sensor, this means the circuit is empty.*

>Empty sensor feed transport 2 . . : NO
See previous function, but now for feed transport 2.

>Empty sensor feed transport 3 . . : NO
See previous function, but now for feed transport 3.

>Empty sensor feed transport 4 . . : NO
See previous function, but now for feed transport 4.

>Empty sensor feed transport 5 . . : NO
See previous function, but now for feed transport 5.

>Empty sensor feed transport 6 . . : NO
See previous function, but now for feed transport 6.

Menu: control names.

The various controls may be labelled with one's own selected names, this to make it simpler for the user to distinguish between them. Press function button  and the menu that alows you to set these names will be opened. You set names as follows: the cursor buttons = and < are pressed to select each single character of the name. The selected letter is indicated by an inverted cursor block. Then the selected letter can be changed by pressing the plus value and minus value buttons. The letter of your choice must be confirmed by a click on the SET-button, after which it will be memorized. Next you again use the cursor buttons to select a following character and adjust it to one's own wishes. In this way the 8 charaters of the control name can be set. The name selected by you will be displayed at the corresponding control in the head line of the menu.

>Name p-control 1 . . . . . :P-CONTR.1
Here the name for p-control 1 can be entered to one's own views in the way as described above.

The following settings in this menu can be used to set the names for all the other p-controls, all on/off controls, the 4 general temperature curves, the stage ventilation controls, the circulation controls, the additional timer controls, the light controls, the water metering controls and the feed controls. These settings will further remain undiscussed.

Menu: settings M3 stage ventilation.

The settings in this menu allow you to set the air amounts for each individual ventilation group of the stage ventilation. The Navigator calculates the desired amount of air and will define, on the basis of these settings, which group or groups must be switched on in order to reach said amount of air. The menu is opened by pressing function button  .

>M3 var.group stage vent.1 : 10000 M3
Stands for the air amount produced by the stepless group of stage ventilation 1. The stage ventilation will always first regulate the stepless ventilation group up in order to reach the desired amount of air. The moment the stepless group has arrived at 100%, an additional group is added and the stepless group is regulated back again, after which the process starts all over again.

>M3 group 1 stage vent.1 . . . . . : 10000 M3
Stands for the air capacity of ventilation group 1. The group will be switched the moment the stepless group is regulated to 100%.

>M3 group 2 stage vent.1 . . . . . : 10000 M3
Same as previous function, but now for ventilation group 2.

>M3 group 3 stage vent.1 . . . . . : 10000 M3
Same as previous function, but now for ventilation group 3.

>M3 group 4 stage vent.1 . . . . . : 10000 M3
Same as previous function, but now for ventilation group 4.

>M3 group 5 stage vent.1 . . . . . : 10000 M3
Same as previous function, but now for ventilation group 5.

>M3 group 6 stage vent 1 . . . . . : 10000 M3
Same as previous function, but now for ventilation group 6.

>Delay time group 1 stage vent.1 . : 0:00 M:S
The moment ventilation group 1 must be switched on after the computer calculation, this time will be taken as delay time in order to prevent unnecessary quick switching. The delay time makes it also possible to synchronize the switching speed of fan groups that switch on and off their fans by means of a magnetic switch, with groups that switch on and off their fans by means of a valve gear (valve mounted in the ventilation chimney plus mechanical switch for the fan).

>Delay time group 2 stage vent.1 . : 0:00 M:S
Same as previous setting, but now for group 2.

>Delay time group 3 stage vent.1 . : 0:00 M:S
Same as previous setting, but now for group 3.

>Delay time group 4 stage vent.1: 0:00 M:S
Same as previous setting, but now for group 4.

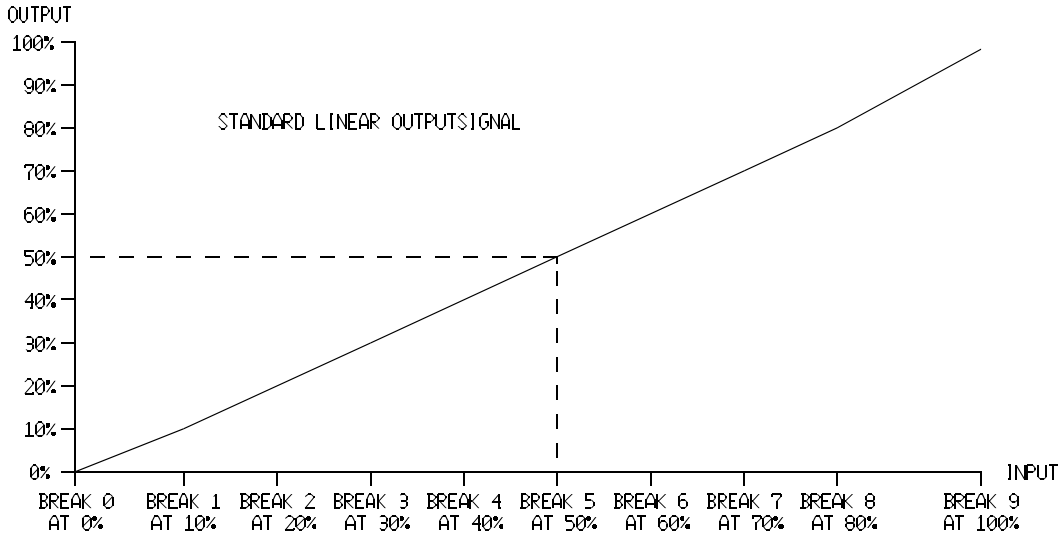
>Delay time group 5 stage vent.1 . : 0:00 M:S
Same as previous setting, but now for group 5.

>Delay time group 6 stage vent.1 . : 0:00 M:S
Same as previous setting, but now for group 6.

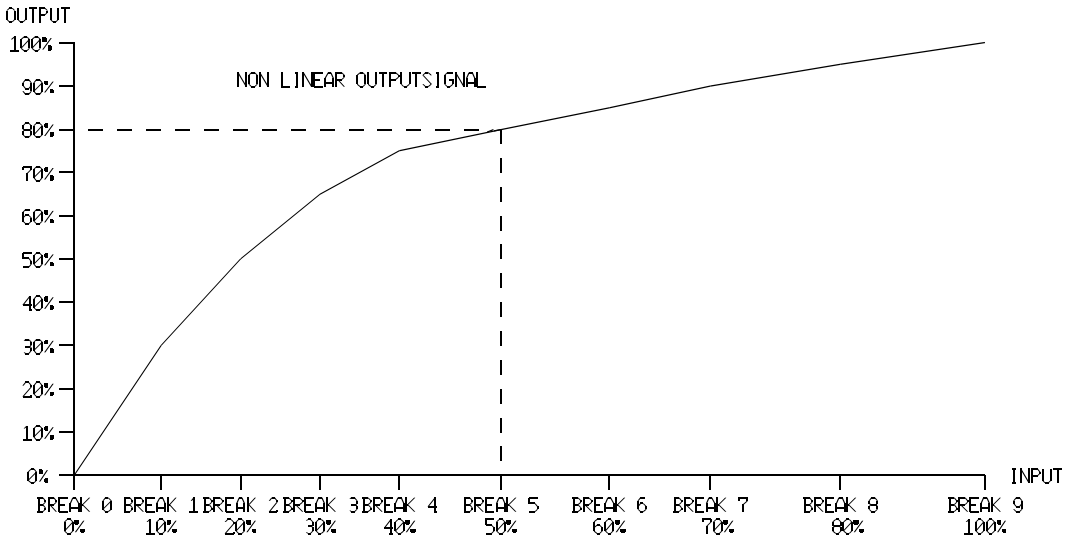
All the other settings deal with stage ventilation 2 and are, for the rest, identical to the settings as described above.

Menu: settings analog outputs 1-20.

These menus allow you to adjust the control signals from the analog inputs to one's own wishes. Default the analog outputs have a linear course. That is to say, that a 4-20mA output has a proportional control signal of 4 to 20mA with a controlling percentage of 0 to 100%. See figure below.



The output curve can also be adjusted completely in accordance with one's own views e.g. when you wish a non-linear course for an air inlet. See figure below.



To enter these menus you press one of function buttons  to  ..

>Control signal at break 0 (=0%) . : 0 %

Here you define the percentage of the control signal to be emitted at break 0. *Attention: break 0 always lies at an input signal of 0%.*

>Input at break 1 . . . . . : 10 %

Here you define where breakpoint 1 should be. Default this breakpoint lies at an input signal of 10%.

>Control signal at break 1 . . . . . : 10 %

This is the control signal indicated in a percentage, when the input signal lies at breakpoint 1.

>Input at break 2 . . . . . : 20 %
Same as input at break 1, but now for break 2.

>Control signal at breakpoint 2 . . : 20 %
Identical to control signal at break 1, but now for break 2.

>Input at breakpoint 3 . . . . . : 30 %
Same as input at break 1, but now for break 3.

>Control signal at breakpoint 3 . . : 30 %
Identical to control signal at break 1, but now for break 3.

>Input at breakpoint 4 . . . . . : 40 %
Same as input at break 1, but now for break 4.

>Control signal at breakpoint 4 . . : 40 %
Identical to control signal at break 1, but now for break 4.

>Input at breakpoint 5 . . . . . : 50 %
Same as input at break 1, but now for break 5.

>Control signal at breakpoint 5 . . : 50 %
Identical to control signal at break 1, but now for break 5.

>Input at breakpoint 6 . . . . . : 60 %
Same as input at break 1, but now for break 6.

>Control signal at breakpoint 6 . . : 60 %
Identical to control signal at break 1, but now for break 6.

>Input at breakpoint 7 . . . . . : 70 %
Same as input at break 1, but now for break 7.

>Control signal at breakpoint 7 . . : 70 %
Identical to control signal at break 1, but now for break 7.

>Input at breakpoint 8 . . . . . : 80 %
Same as input at break 1, but now for break 8.

>Control signal at breakpoint 8 . . : 80 %
Identical to control signal at break 1, but now for break 8.

>Control signal at breakpoint 9 (=100%) : 100 %
Identical to control signal at break 1, but now for break 9. *Attention: breakpoint 9 always lies at an input signal of 100%.*

Menu: settings input stage ventilation 1 and 2.

These menus have the same function as the previous menu, but now for the stage ventilation controls. The stage ventilation controls get their control signal from a connected p-control. The two menus also allow you to adjust this control signal to one's own wishes. Default the control signal has a linear setting. You enter the menus by pressing funnction buttons  or  .
The settings in these menus are identical to the control signal settings of the analog outputs. See for this the previous menu.

Menu: acoustic alarm signalling.

Here the setting can be made to select for loud alarm signalling or for only silent alarm signalling. An acoustic alarm appears in the display and causes, after a short delay time, the alarm relay to be released, which activates an externally connected alarm device. Alarms that are NOT acoustically defined, will only appear in the display as an announcement. In this case the alarm relay will not be released. You enter the menu by pressing function button  .

>Sensor 1 defective . . . . . : ON

This setting defines if the alarm 'sensor 1 defective' must be passed on acoustically. **ON** means yes, **OFF** means **NO**. Note: Be careful to select silent alarms. It goes without saying that essential alarms, such as on maximum temperature or on a defective sensor should always be selected to be loud alarms. **It is also important to make use of an additional temperature alarm, i.e. an alarm entirely independent of the computer, to secure alarm signalling even at computer failure. Test this alarm at least once a day.**

The other alarms can be set in the same way and speak for themselves. They need, therefore, not be explained further.

Menu: heat demand boiler control.

The boiler control of the Navigator can be set, so that the computer only controls when heat is demanded by one or more p-controls or on/off controls. Which controls may be 'authorized' to ask the boiler control for heat demand can be defined in this menu. The menu is selected by pressing function button  .

>P-control 1 . . . . . : OFF

This setting indicates if p-control 1 should emit a control signal to the boiler control when heat is required. The moment the control signal of the p-control exceeds 0% a heat demand signal will be emitted. **ON** = p-control passes heat demand on to boiler control. **OFF** = this p-control does not pass any heat demand on to the boiler control. *Note: switch on the heat demand only if the p-control is used as heating control. In case the p-control is used for cooling (or ventilation), this function must be set at **OFF**.*

The following functions are identical to the above mentioned function, but now for p-controls 2 to 20 inclusive. *Note: if the p-control has not been activated in the installer's program, the heat demand setting will be void.*

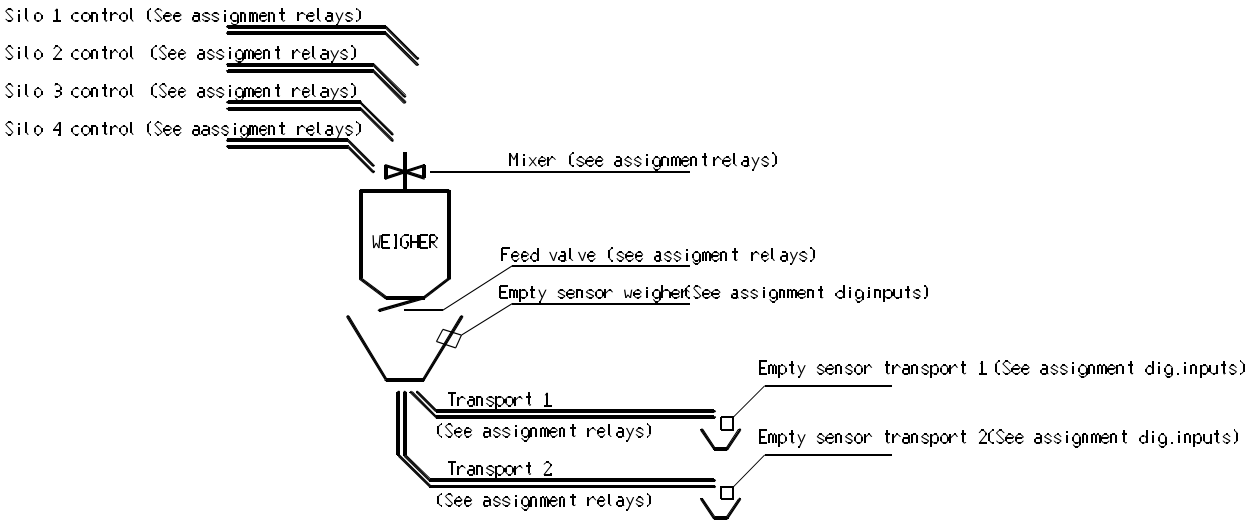
>On/off control 1 . . . . . : OFF

This function works in the same way as is the case with the settings voor de p-controls. Dealing with these settings ensure that the corresponding on/off control is actually used for heating. The moment the on/off control is switched on, a signal for heat demand is passed on to the boiler control.

The following settings all deal with the heat demand setting of the other on/off controls. They are identical to the setting mentioned above and remain, therefore, undiscussed. *Note: if during installation an on/off control remains deactivated, its heat demand setting will have no effect.*

Menu: settings/calibrate feed weigher.

When you have equipped the Navigator with a feed weigher, you have to calibrate this weigher. Below you see a drawing of the feed system with a weigher. In this drawing you see 4 augers who transports the feed from the silo's to the weigher. When the weigher has made a feed portion, the feed transport will transport this feed to the feeding system in the barn. This feeding system can be a system of another Navigator.



The feed weigher controls the augers in such a way that the weigher will be filled with the right proportions of feed. When the portion in the weigher is completed, the valve drops this feed below the weigher. Now the concerning feed transport circuit is switch on to transports this feed to the demanding feeding system in the barn. As soon as the empty sensor in the weigher signals the weigher is empty, another feeding system can be provided with feed. The feed weigher determines whether a feeding system has a feed demand or not by asking the status of the feeding system (This can also be done by a local network) and checking the empty sensor of the concerning feed transport circuit.

The calibration and adjustments of the weigher is possible with help of this menu. Select this menu by pressing the function key  .

>Mode calibration weigher . . . . . : 0

With this function you can calibrate the feed weigher. The calibration goes as follows:
- Be sure the weigher is empty. The next function shows the reading of the weigher. This reading shoeld be between 1500 and 2000. If not, correct the weigher converter till these values are met.
- Switch this setting to 1 and press the SET-key. Now the measurement for 0 Kg will be programmed in the memory. After a few seconds this mode will be switched back to 0.
- Put a calibration weight in the weigher. Use a calibration weight which is almost equal to a full weigher.
***Remark**: the weight of the calibration weight should be known as accurate as possible.*
- Switch this setting to 2 and press the SET-key. Now the measurement of the calibration weight is programmed into the memory. After a few seconds this function will be switched back to 0.

>Measurement AD-converter . . . . : 1762

This is the value of the AD-converter inside the Navigator. This value can be used to calibrate the weight converter. An empty weigher should give a reading between 1500 and 2000.

>Measurement weigher . . . . . : 0,00 Kg

When the calibration is finished, this reading shows the weight in the weigher. You can use this for control purposes.

>Minimum calibration . . . . . : 1652

This is the AD-converter value inside the Navigator memory for 0Kg.

>Maximum calibration . . . . . : 6827

This is the AD-converter value belonging to the calibration weight.

>Calibration weight . . . . . : 10000 gr.
Here you have to adjust the value for the calibration weight, which is used for calibration. Do thsi as accurate as possible.

>Pause stabilize weigher . . . . . : 0:03 M:S
When the weight in the weigher has reached the right amount, the Navigator will wait this number of seconds to stabilize the weigher. After this delay the exact weight is measured.

>Pre-pause feed valve . . . . . : 0:02 M:S
This is the number of seconds delay before the feed valve is activated. This pause can be used to start the feed transport circuit before the feed valve is emptying the feed in the transport circuit. (in some cases the feed transport circuit can be a moving valve, which opens a circuit. This moving valve has to be in position before the feed valve in the weigher is activated).

>Active time feed valve . . . . . : 0:05 M:S
This is the time the feed valve is active. When you use a pulling magnet to open the feed valve, select a short active time (1-2 sec) and a longer pause time (10-15 sec, see next function). When the feed valve is working with air-pressure or with an motor, then select an active time as long as the valve needs to be open (plus the time to open the valve). The pause time can be short. (see next function)

>Pause time feed valve . . . . . : 0:10 M:S
This is the number of seconds after used as a pause time after the feed valve was active. When you use a pulling magnet, this is the time needed to emptying the weigher. When you use a valve working on air-pressure or motor, this is the time needed to close the feed valve.

>Mixer active time . . . . . : 0:00 M:S
When you have equipped the weigher with a mixer, this is the time the mixer is active after the weigher is filled. ***Remark****: when you don't use a mixer, just select 0:00 seconds.*

>Maximum weight in the weigher . : 30,0 Kg
This is the maximum weight that the weigher can containe. The Navigator will always make feed portions of this size.

>Afterrun time transport 1 . . . . . : 0:00 M:S
After emptying the weigher in the feed transport circuit, this feed transport circuit will be activated. When the Navigator finds the hopper under the weigher is empty, this afterrun time is started. After this time the feed transport circuit is stopped again till a new portion of feed is ready to transport.

>Afterrun time transport 2 . . . . . : 0:00 M:S
See previous function, but now for feed transport circuit 2.

>Afterrun time transport 3 . . . . . : 0:00 M:S
See previous function, but now for feed transport circuit 3.

>Afterrun time transport 4 . . . . . : 0:00 M:S
See previous function, but now for feed transport circuit 4.

>Afterrun time transport 5 . . . . . : 0:00 M:S
See previous function, but now for feed transport circuit 5.

>Afterrun time transport 6 . . . . . : 0:00 M:S
See previous function, but now for feed transport circuit 6

>Max.time filling weigher . . . . . : 2:00 M:S
This is the maximum time that can be used for filling the weigher. Is the weigher not full after this time, an alarm will be generated and the filling of the weigher will be stopped.

>Transport 1 –> Nav.ID . . . . . : 0

Here you can select to which Navigator the feed transport circuit 1 is transporting the feed. Adjust the computer ID of the concerning Navigator. ***Remark****: every Navigator needs an unique computer ID. You have to use this computer ID in this setting. This is important when more then one Navigator are using the same feed weigher by a local network.*

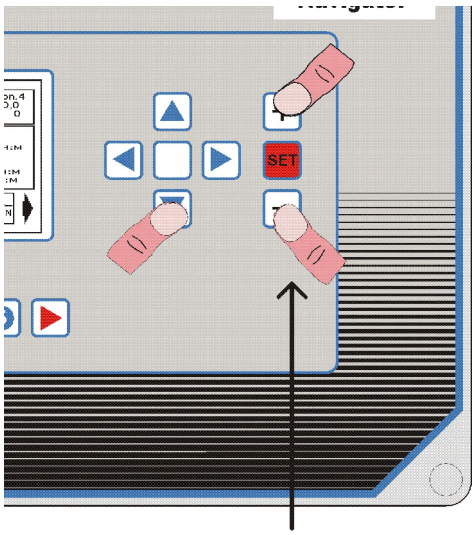
>Transport 1 –> Nav.circ. . . . . : 0

Here you select which feeding system uses the feed transport circuit 1. If you don't use this feed transpport circuit, just set this function to 0.

The next functions are identical to the previous functions, but now for the feed transport circuit 2 till 6. The weigher can control up to 6 feed transport circuits. How many circuits can be controlled by one weigher is depending on the capacity of the weigher, augers a.s.o.

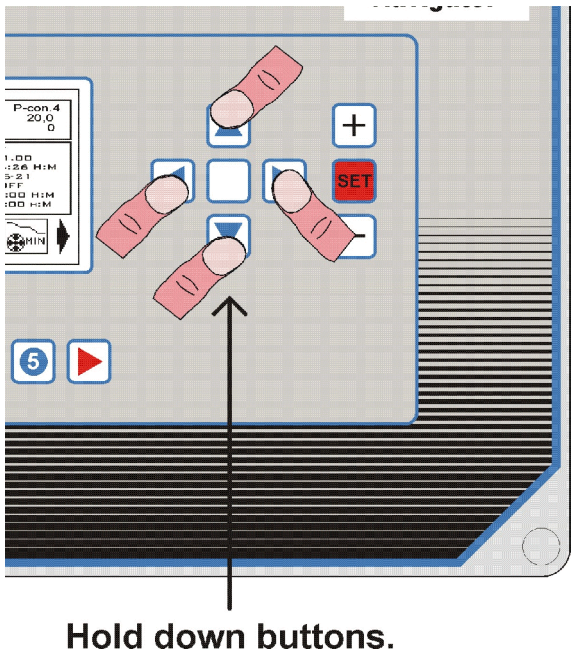
To exit the installer's program.

To exit the installer's program you proceed as follows: press and hold down simultaneously cursor button ?, the plus value button and the minus value button. After the display comes with the text **== USER'S PROGRAM IS STARTED ==** the buttons can be released. Then the installer's program will be terminated and the user's program will be started.



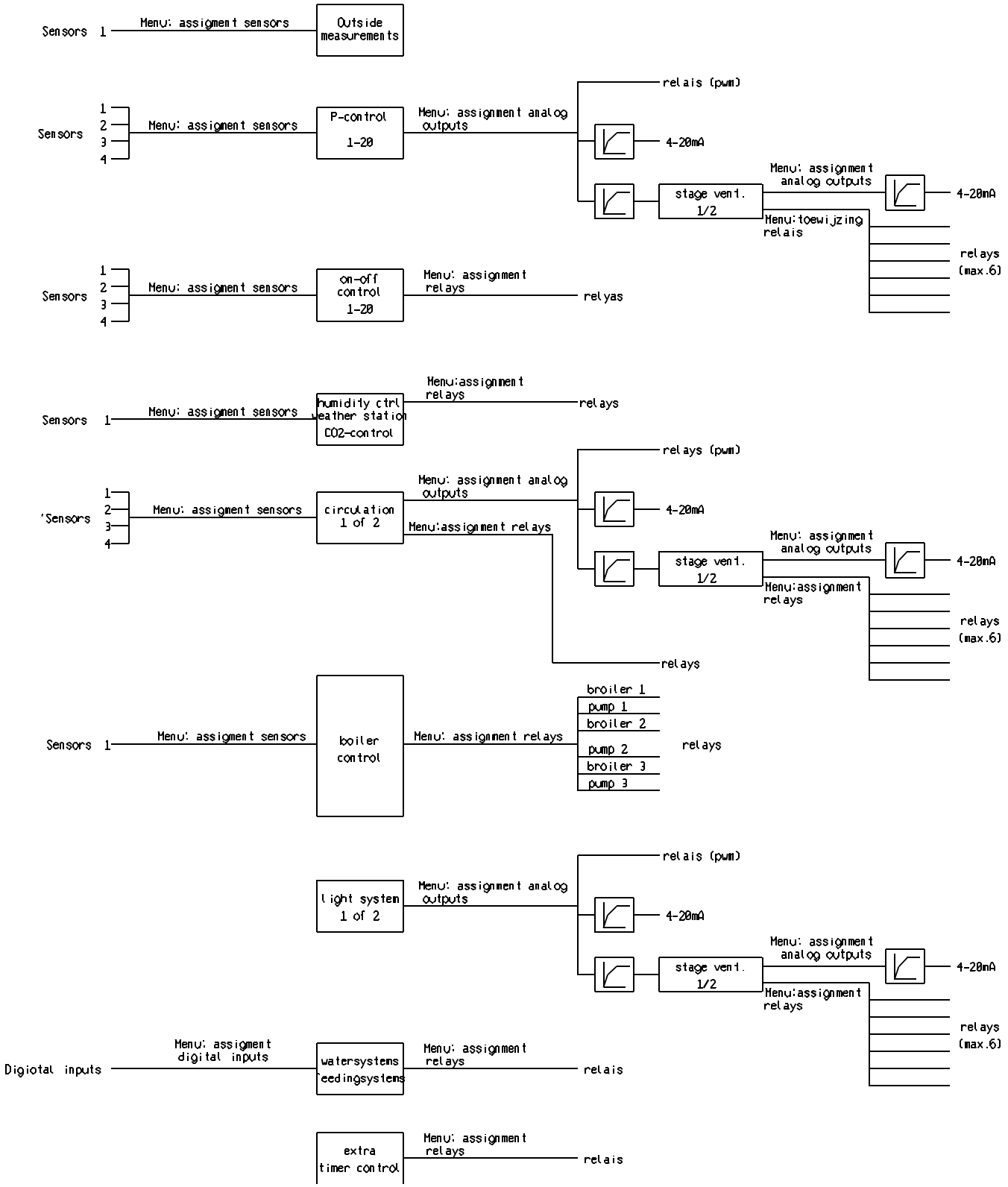
Starting up on default assignments.

All assignments are memorized by the Navigator. To start with the default assignments you proceed as follows: press and hold down the cursor buttons =, <,>, and ? simultaneously. until the display comes with the announcement 'RESTORE ASSIGNMENTS IS STARTED'. Then the buttons can be released, after which the assignments will be restored. In the display a memory counter shows the course of the restoration process. See also the installer's manual. **Important: only execute this action after you have made certain that the assignments should really be deleted, as the original configuration will be lost and can only be restored manually. Ensure, therefore, that the original configuration is taken down.**



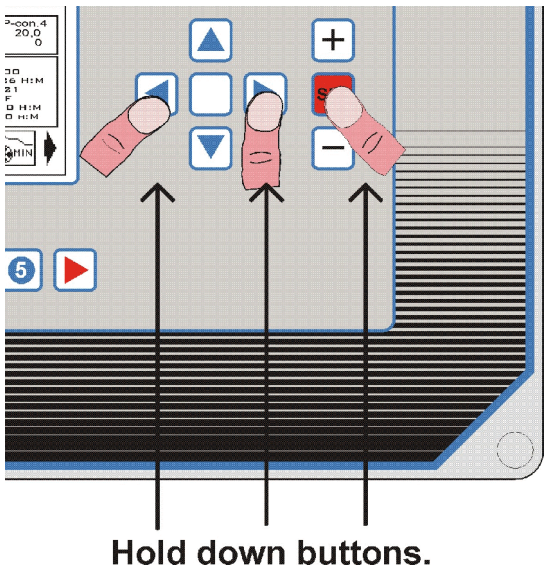
Hold down buttons.

Diagrammatical outline of the connections between sensors and outputs.

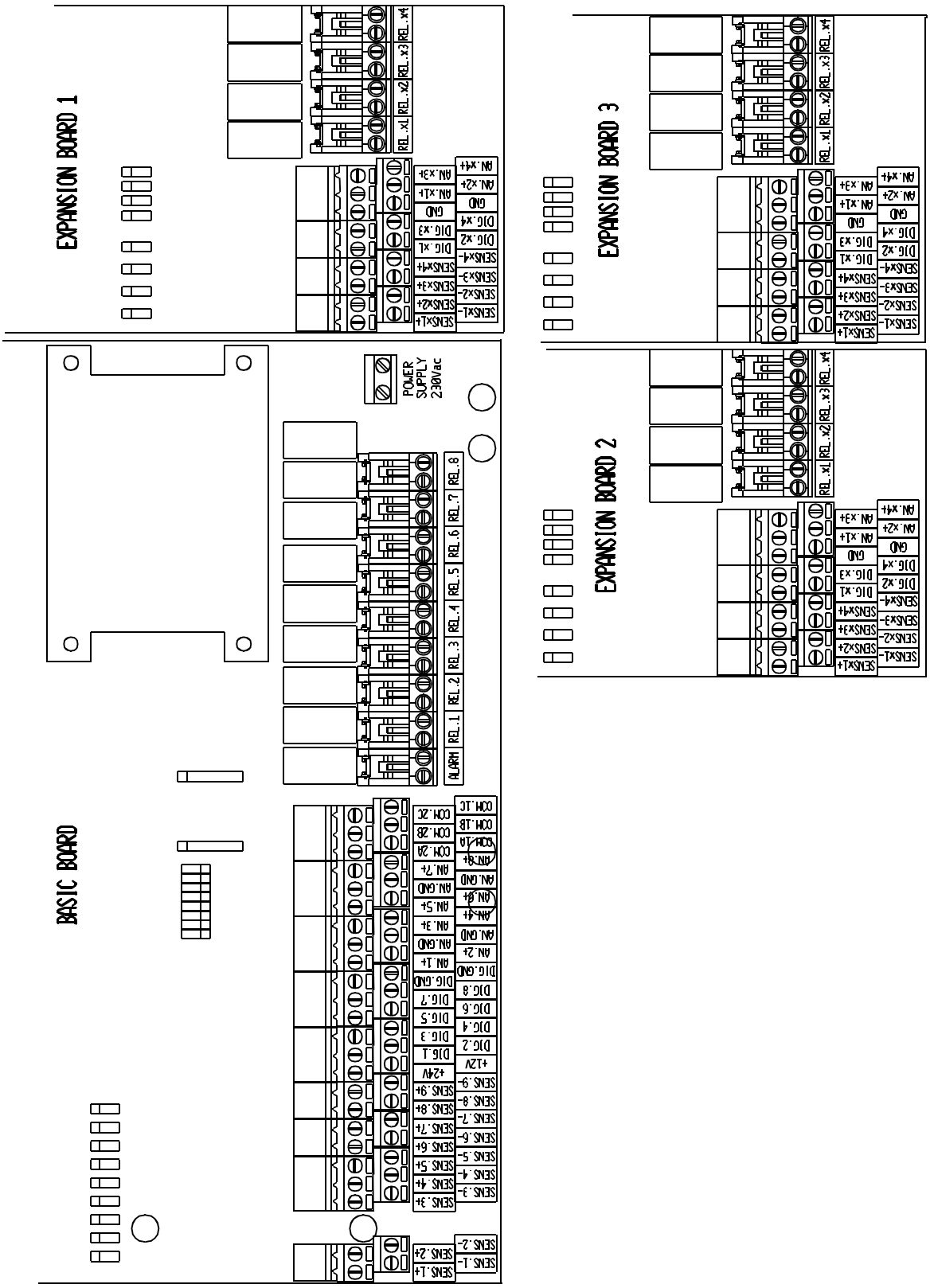


Starting up on default settings.

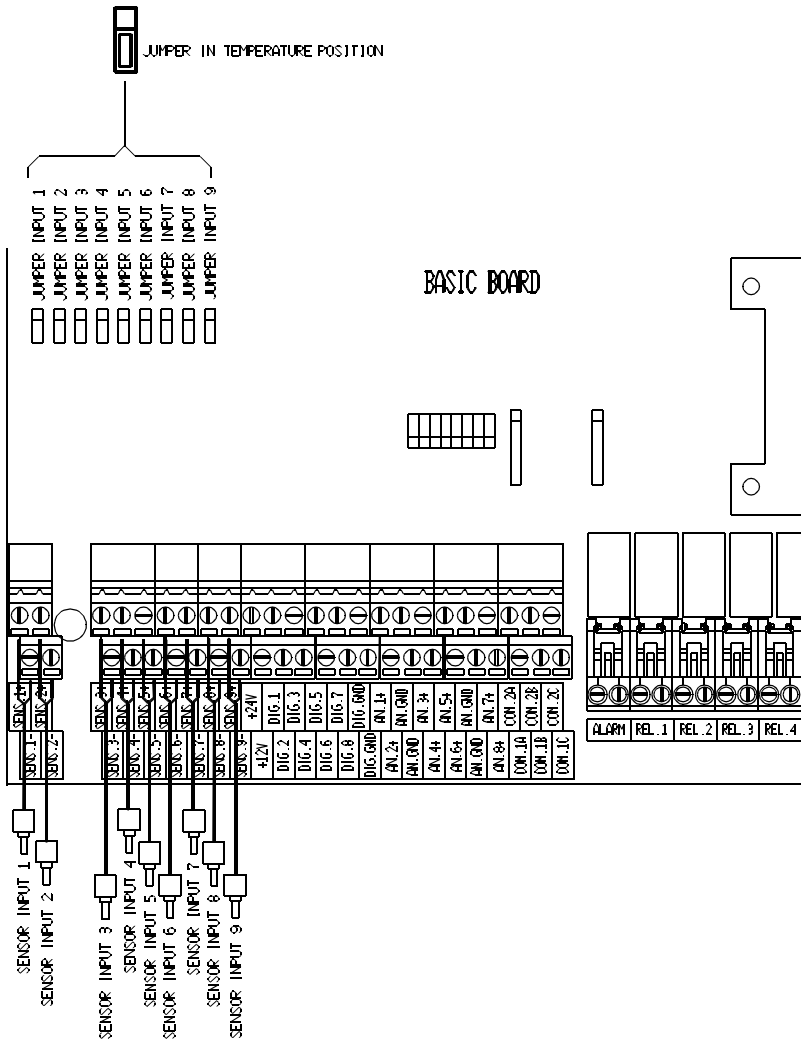
The Navigator is equipped with a backup battery. It ensures that the user's settings will stay memorized for a couple of months after disconnection of the computer. Switching on the Navigator within this period makes it possible to have the user's settings again at one's disposal. To replace the user's settings by the default settings you press and hold down the cursor buttons ? and ? and the SET-button simultaneously, until the display has been deleted and comes with the announcement '**RESTORE SETTINGS IS STARTED**'. Then the buttons can be released and the deletion of the user's settings is started. In the display a counter shows what function is being restored. At the end of this process the program continues with the user's program, that will run on the default settings then. See also the installer's manual. **Important: only execute this action after you are sure that your personal settings should really be replaced by the default settings, as the user's settings will definitely be lost afterwards.**



General outline connections.



Wiring diagram temperature sensors.

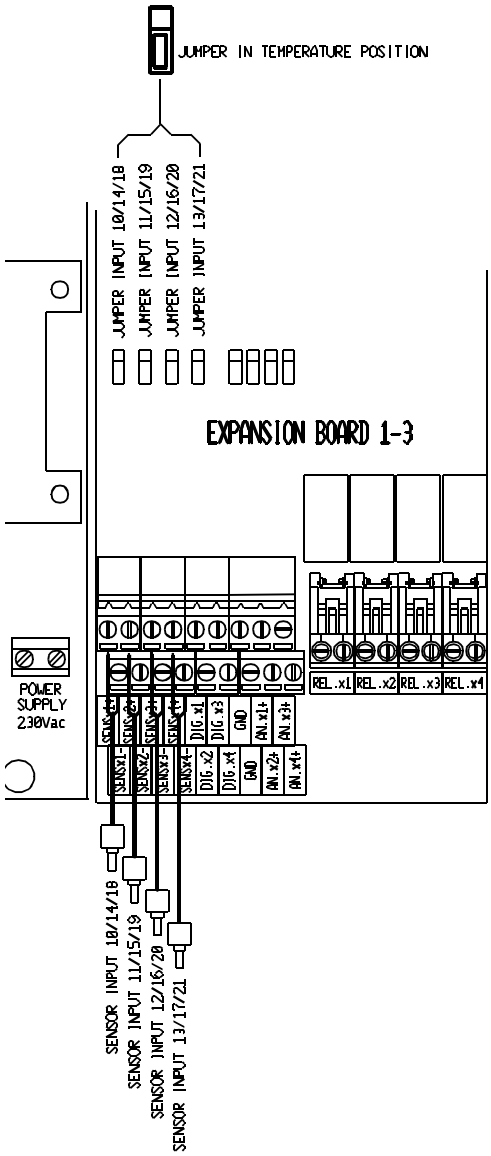


Important! *To connect all sensor cabling always use shielded cable with a minimum diameter of 0.8 mm². Connect the shielding in the computer always to the minus terminal of the corresponding sensor. Do not connect the shielding in the sensor.*

Note: *put jumper 'TEMPERATURE / VOLT' for the inputs that are used in the right position. See wiring diagram above.*

Basic bottom board

Sens.1- / Sens.1+	=	sensor input 1
Sens.2- / Sens.2+	=	sensor input 2
Sens.3- / Sens.3+	=	sensor input 3
Sens.4- / Sens.4+	=	sensor input 4
Sens.5- / Sens.5+	=	sensor input 5
Sens.6- / Sens.6+	=	sensor input 6
Sens.7- / Sens.7+	=	sensor input 7
Sens.8- / Sens.8+	=	sensor input 8
Sens.9- / Sens.9+	=	sensor input 9



Extension board 1

Sens.x1- / Sens.x1+	=	sensor input 10
Sens.x2- / Sens.x2+	=	sensor input 11
Sens.x3- / Sens.x3+	=	sensor input 12
Sens.x4- / Sens.x4+	=	sensor input 13

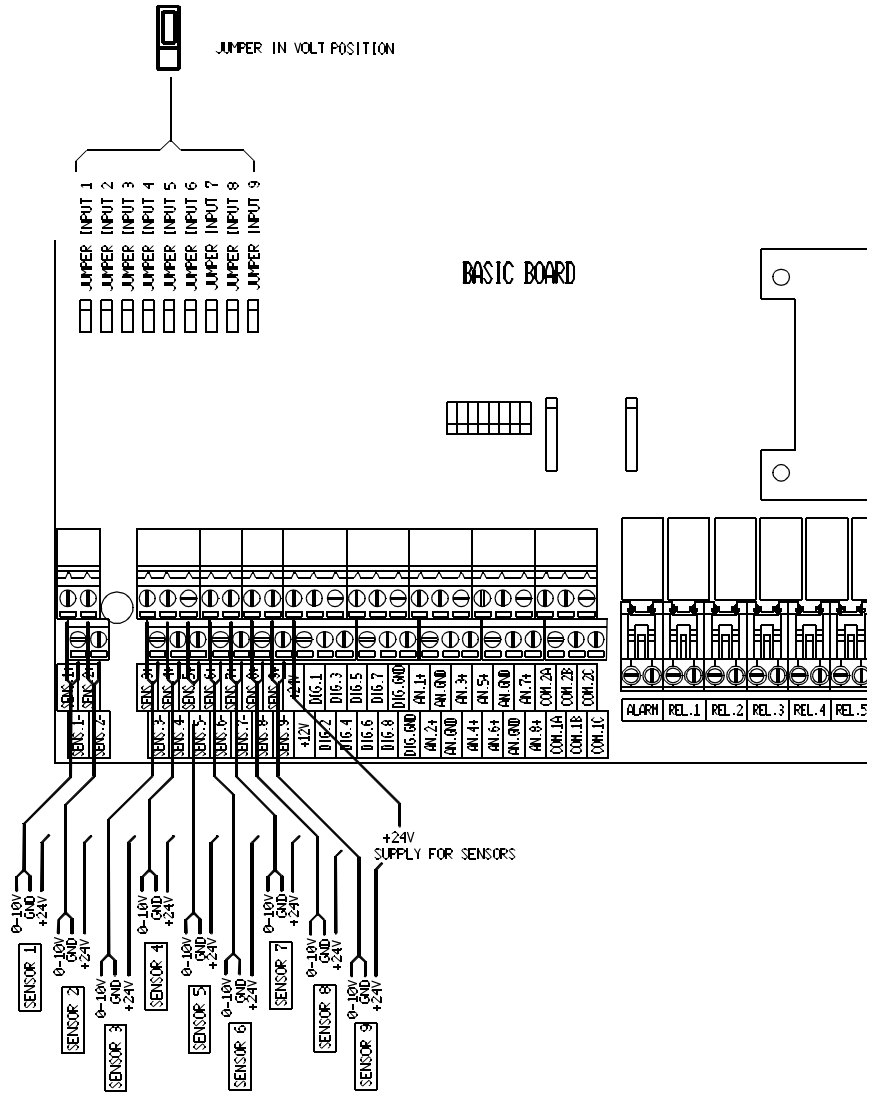
Extension board 2

Sens.x1- / Sens.x1+	=	sensor input 14
Sens.x2- / Sens.x2+	=	sensor input 15
Sens.x3- / Sens.x3+	=	sensor input 16
Sens.x4- / Sens.x4+	=	sensor input 17

Extension board 3

Sens.x1- / Sens.x1+	=	sensor input 18
Sens.x2- / Sens.x2+	=	sensor input 19
Sens.x3- / Sens.x3+	=	sensor input 20
Sens.x4- / Sens.x4+	=	sensor input 21

Wiring diagram humidity and CO2 sensors.

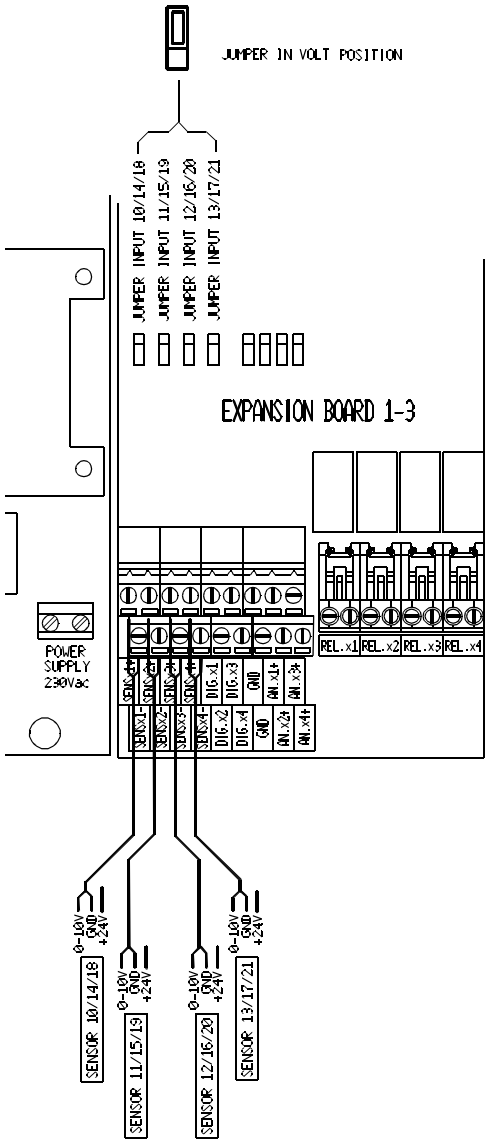


Important! *To connect the humidity or CO2 sensors always use shielded cable with a minimum diameter of 0.8 mm². Connect the shielding in the Navigator to the corresponding minus terminal. Do not connect the shielding in the sensor.*

Note: *put jumper 'TEMPERATURE / VOLT' in position 'VOLT' for the inputs that are used. See wiring diagram above.*

Basic bottom board

Sens.1- / Sens.1+ / +24V	=	humidity or CO2 sensor input 1
Sens.2- / Sens.2+ / +24V	=	humidity or CO2 sensor input 2
Sens.3- / Sens.3+ / +24V	=	humidity or CO2 sensor input 3
Sens.4- / Sens.4+ / +24V	=	humidity or CO2 sensor input 4
Sens.5- / Sens.5+ / +24V	=	humidity or CO2 sensor input 5
Sens.6- / Sens.6+ / +24V	=	humidity or CO2 sensor input 6
Sens.7- / Sens.7+ / +24V	=	humidity or CO2 sensor input 7
Sens.8- / Sens.8+ / +24V	=	humidity or CO2 sensor input 8
Sens.9- / Sens.9+ / +24V	=	humidity or CO2 sensor input 9



Extension board 1

Sens.x1- / Sens.x1+ / +24V	=	humidity or CO2 sensor input 10
Sens.x2- / Sens.x2+ / +24V	=	humidity or CO2 sensor input 11
Sens.x3- / Sens.x3+ / +24V	=	humidity or CO2 sensor input 12
Sens.x4- / Sens.x4+ / +24V	=	humidity or CO2 sensor input 13

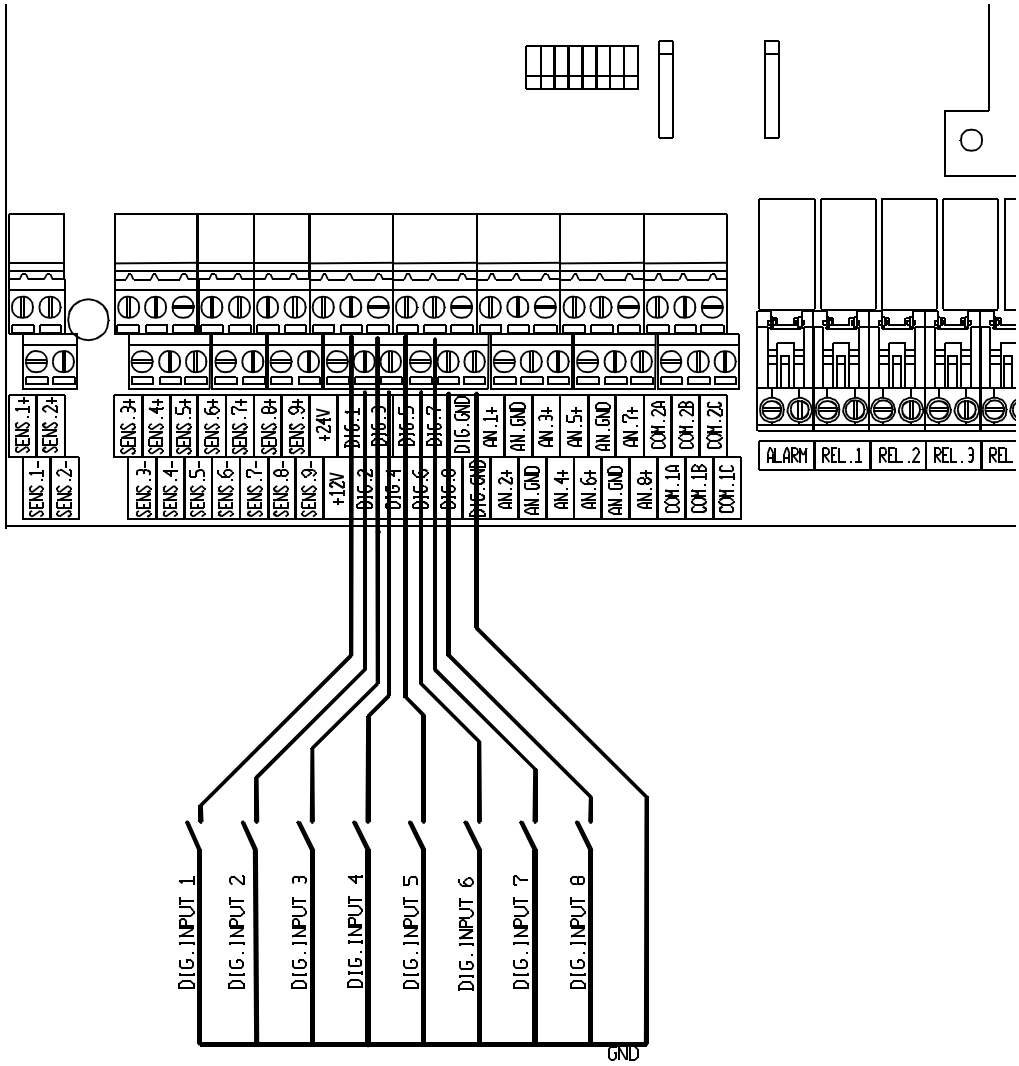
Extension board 2

Sens.x1- / Sens.x1+ / +24V	=	humidity or CO2 sensor input 14
Sens.x2- / Sens.x2+ / +24V	=	humidity or CO2 sensor input 15
Sens.x3- / Sens.x3+ / +24V	=	humidity or CO2 sensor input 16
Sens.x4- / Sens.x4+ / +24V	=	humidity or CO2 sensor input 17

Extension board 3

Sens.x1- / Sens.x1+ / +24V	=	humidity or CO2 sensor input 18
Sens.x2- / Sens.x2+ / +24V	=	humidity or CO2 sensor input 19
Sens.x3- / Sens.x3+ / +24V	=	humidity or CO2 sensor input 20
Sens.x4- / Sens.x4+ / +24V	=	humidity or CO2 sensor input 21

Wiring diagram feed and water counters.

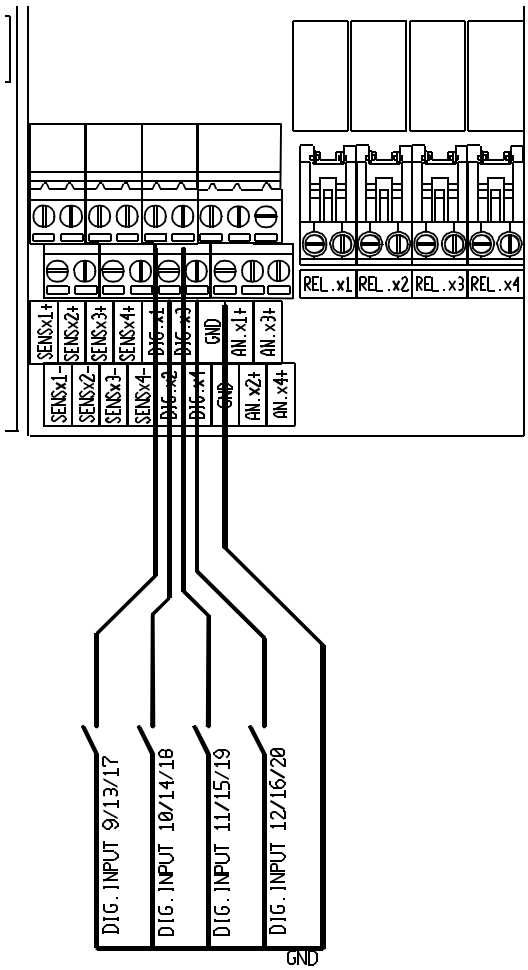


Important! *To connect the feed and/or water counters always use shielded cable with a minimum diameter of 0.8 mm². Connect the shielding in the Navigator to the DIG.GND terminal. Do not connect the shielding at the counter.*

Note: *the Navigator is provided with 2 feeding systems and 2 water metering systems. So a maximum of 4 digital inputs will be used as counter inputs.*

Basic bottom board

DIG.1 + DIG.GND	=	feed/water counter input 1
DIG.2 + DIG.GND	=	feed/water counter input 2
DIG.3 + DIG.GND	=	feed/water counter input 3
DIG.4 + DIG.GND	=	feed/water counter input 4
DIG.5 + DIG.GND	=	feed/water counter input 5
DIG.6 + DIG.GND	=	feed/water counter input 6
DIG.7 + DIG.GND	=	feed/water counter input 7
DIG.8 + DIG.GND	=	feed/water counter input 8



Extension board 1

DIG.x1 + GND	=	feed/water counter input 9
DIG.x2 + GND	=	feed/water counter input 10
DIG.x3 + GND	=	feed/water counter input 11
DIG.x4 + GND	=	feed/water counter input 12

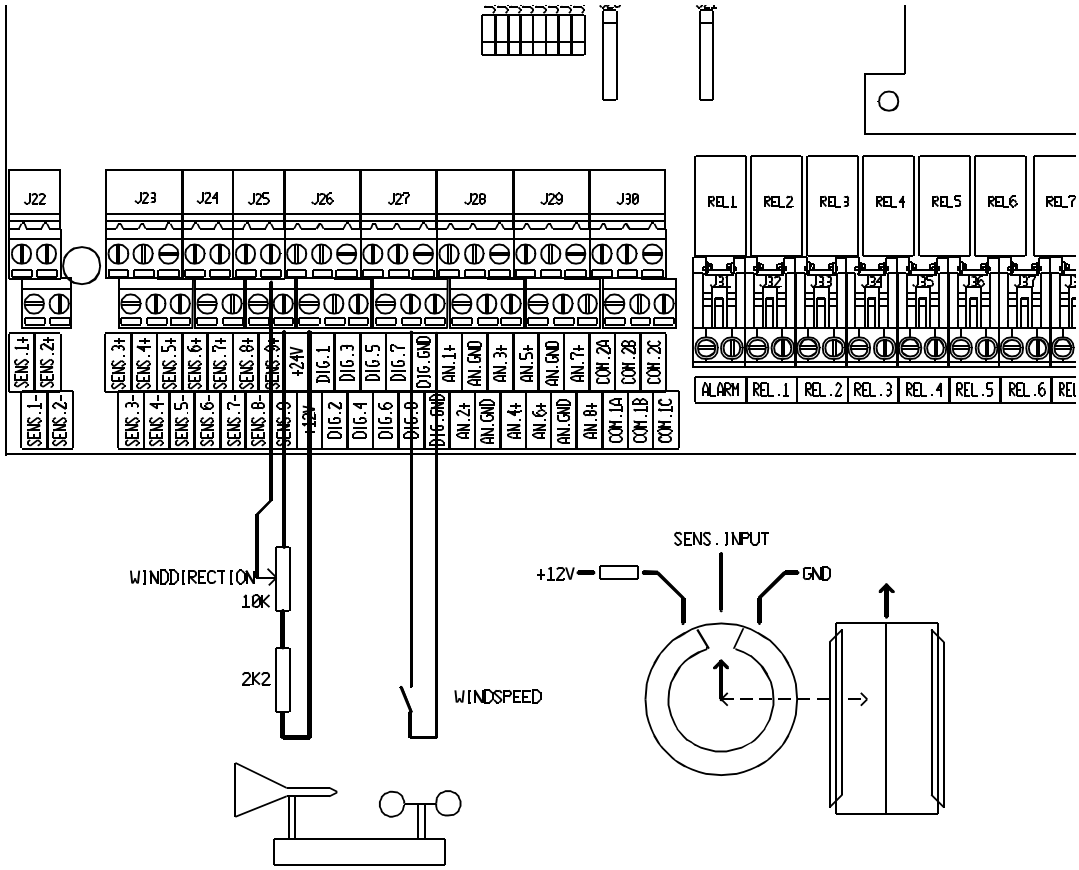
Extension board 2

DIG.x1 + GND	=	feed/water counter input 13
DIG.x2 + GND	=	feed/water counter input 14
DIG.x3 + GND	=	feed/water counter input 15
DIG.x4 + GND	=	feed/water counter input 16

Extension board 3

DIG.x1 + GND	=	feed/water counter input 17
DIG.x2 + GND	=	feed/water counter input 18
DIG.x3 + GND	=	feed/water counter input 19
DIG.x4 + GND	=	feed/water counter input 20

Wiring diagram weather station.

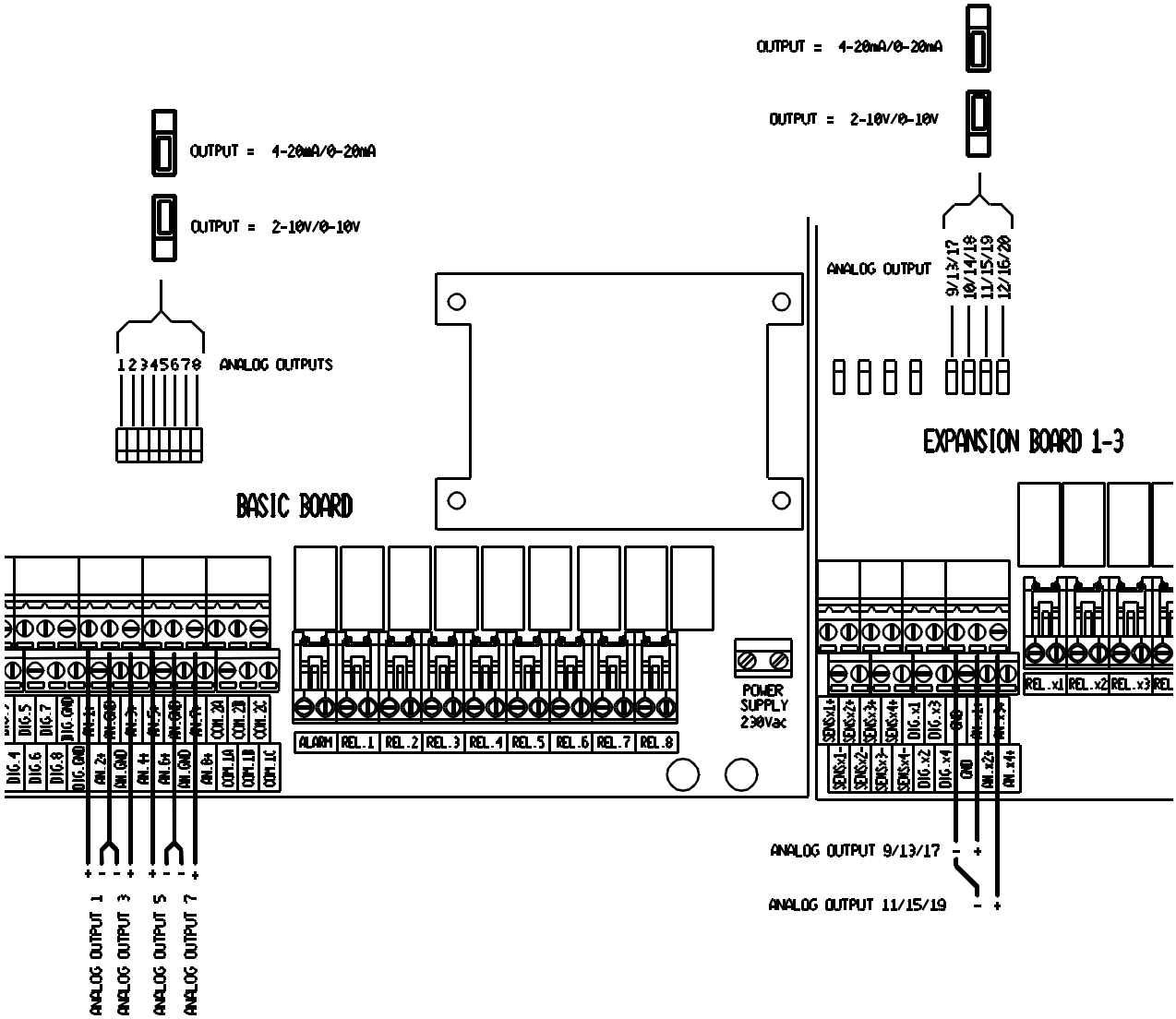


Important! *To connect the weather station always use shielded cable with a minimum diameter of 0.8 mm² and mount the shielding only in the Navigator to terminal SENSOR min.*

Note: *In the figure above the weather station is connected to sensor input 9 (wind direction) and digital input 8 (wind speed). But there are also other inputs that can be used to connect the weather station. In the menu where the assignments of the inputs are executed, you define the input to be used for the wind direction and wind speed.*

To connect the wind direction to the analog inputs see 'Wiring diagram humidity and CO2 sensors'.
To connect the wind speed to the digital inputs see 'Wiring diagram feed and water counters'.

Wiring diagram analog outputs.



Basic bottom board.

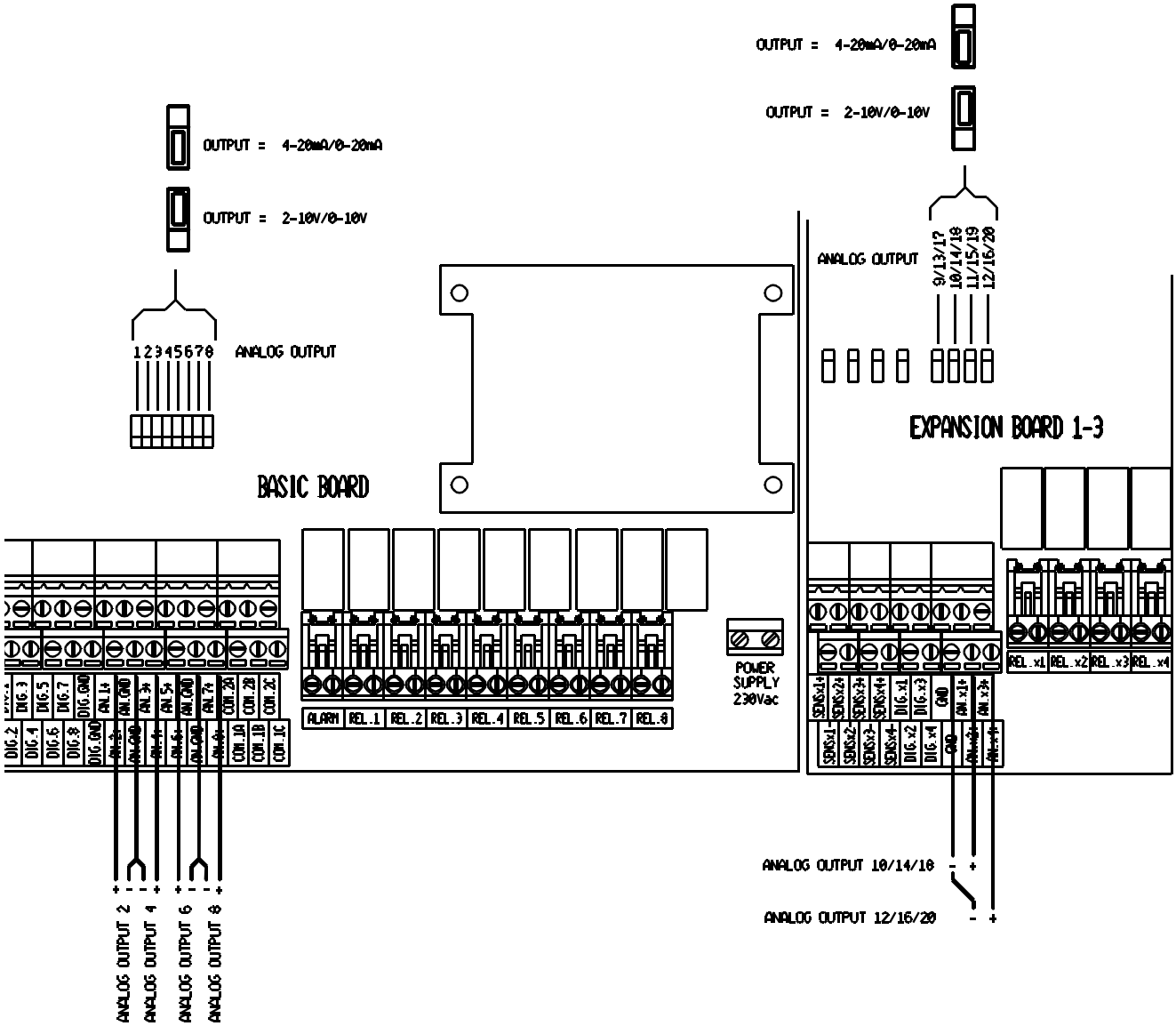
AN.1+ / AN.GND	=	analog output 1
AN.3+ / AN.GND	=	analog output 3
AN.5+ / AN.GND	=	analog output 5
AN.7+ / AN.GND	=	analog output 7

Extension boards.

AN.x1+ / GND	=	analog output 9, 13 or 17 (dependent on extension board 1, 2 or 3.)
AN.X3+ / GND	=	analog output 11, 15 or 19 (dependent on extension board 1, 2 or 3)

Important! *To connect the analog outputs always use shielded cable with a minimum diameter of 0.8 mm². Connect the shielding only in the Navigator to the.GND terminal.*

By changing the corresponding jumper the analog output can be switched from mA control to Volt control. In the installer's program a selection can be made from the following control options:
0-20 mA (Volt control: 0-10V), 4-20 mA (Volt control: 2-10V), 20-0 mA (Volt control: 10-0V) or 20-4 mA (Volt control: 10-2V) See for this **'menu: mode analog outputs.'**



Basic bottom board.

AN.2+ / AN.GND	=	analog output 2
AN.4+ / AN.GND	=	analog output 4
AN.6+ / AN.GND	=	analog output 6
AN.8+ / AN.GND	=	analog output 8

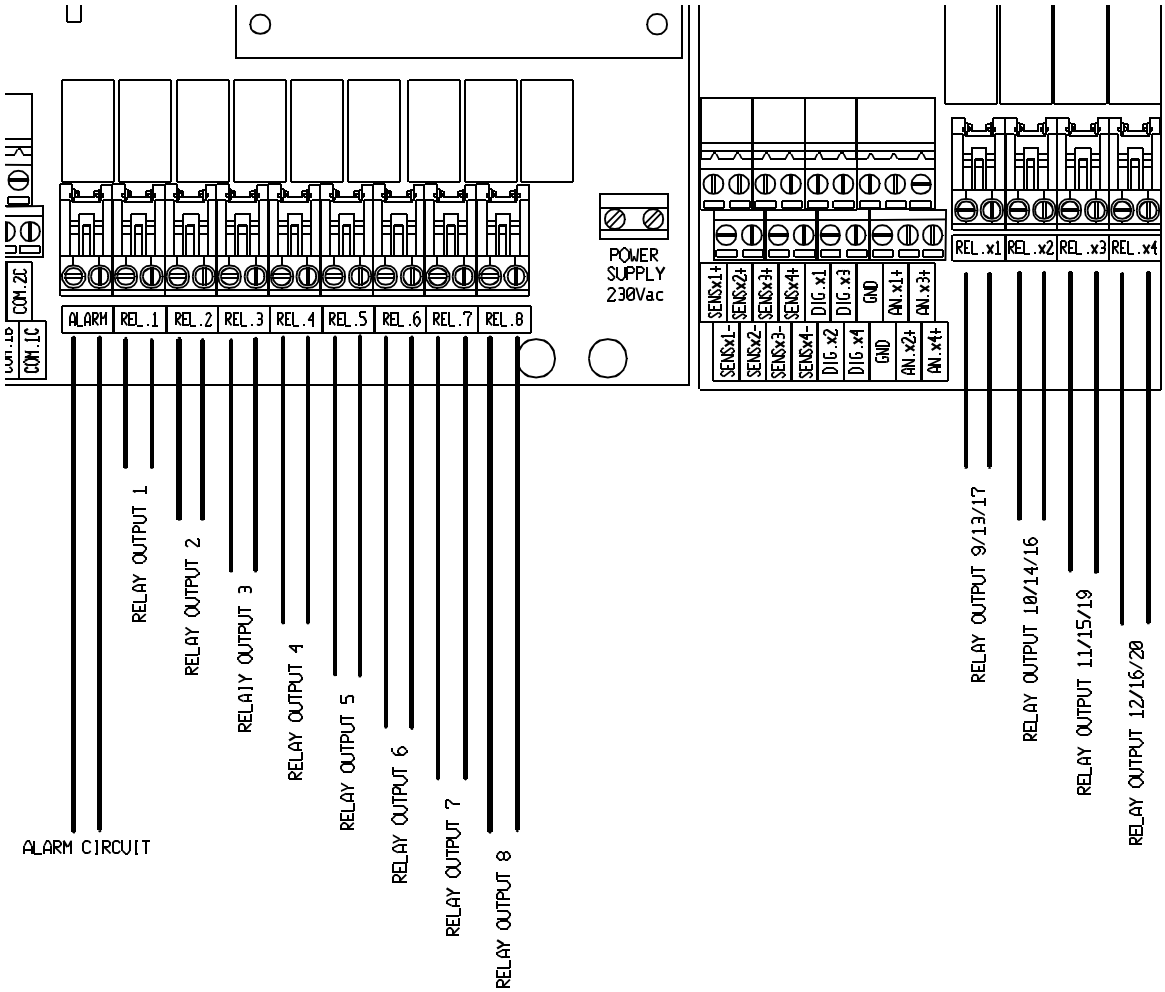
Extension boards.

AN.x2+ / GND	=	analog output 10, 14 or 18 (dependent on extension board 1, 2 or 3.)
AN.X4+ / GND	=	analog output 12, 16 or 20 (dependent on extension board 1, 2 or 3)

Important! *To connect the analog outputs always use shielded cable with a minimum diameter of 0.8 mm². Connect the shielding only in the Navigator to the.GND terminal.*

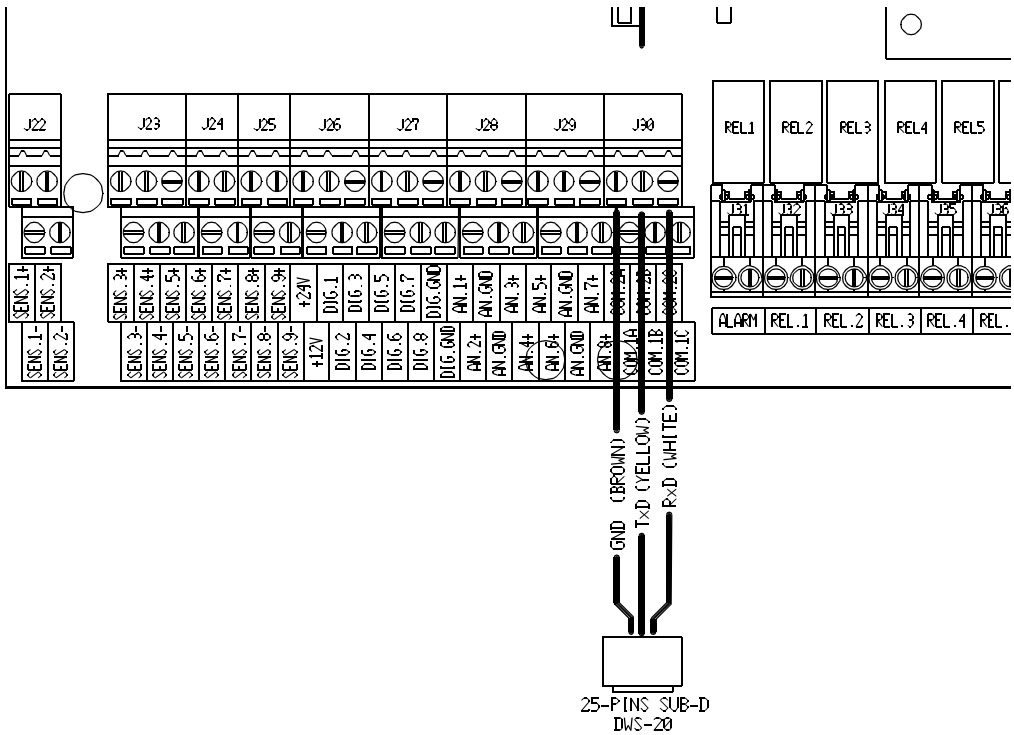
By changing the corresponding jumper the analog output can be switched from mA control to Volt control. In the installer's program a selection can be made from the following control options:
0-20 mA (Volt control: 0-10V), 4-20 mA (Volt control: 2-10V), 20-0 mA (Volt control: 10-0V), or 20-4 mA (Volt control: 10-2V) See for this **'menu: mode analog outputs.**

Wiring diagram relay outputs.



ALALARM = terminal alarm circuit. When there is no alarm, the relay contacts are closed. The moment an alarm is detected, the circuit will be opened.
REL.1 = relay output 1
REL.2 = relay output 2
REL.3 = relay output 3
REL.4 = relay output 4
REL.5 = relay output 5
REL.6 = relay output 6
REL.7 = relay output 7
REL.8 = relay output 8
REL.x1 = relay output 9, 13 or 17 (dependent on extension board 1, 2 or 3)
REL.x2 = relay output 10, 14 or 18 (dependent on extension board 1, 2 or 3)
REL.x3 = relay output 11, 15 or 19 (dependent on extension board 1, 2 or 3)
REL.x4 = relay output 12, 16 or 20 (dependent on extension board 1, 2 or 3)
Note: the relay contacts may have a maximum load of 2Amp. 24V ac/dc

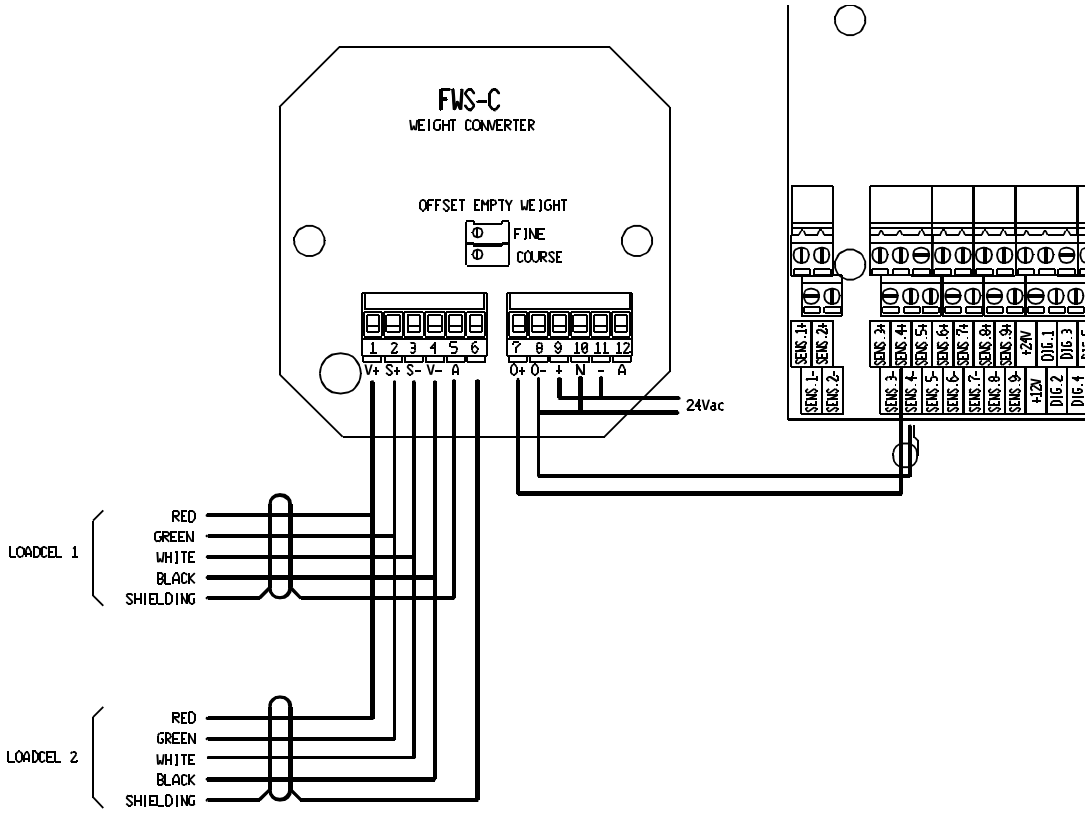
Wiring diagram for DWS-20 birdweigher.



COM.2A = Brown = GND
COM.2B = Yellow = TxD (transmitted data to DWS-20)
COM.2C = White = RxD (received data from DWS-20)

Specification communication:
Baudrate : 38400 baud
Databits : 7
Paraity : even
Stopbits : 1

Wiring diagram feed converter.

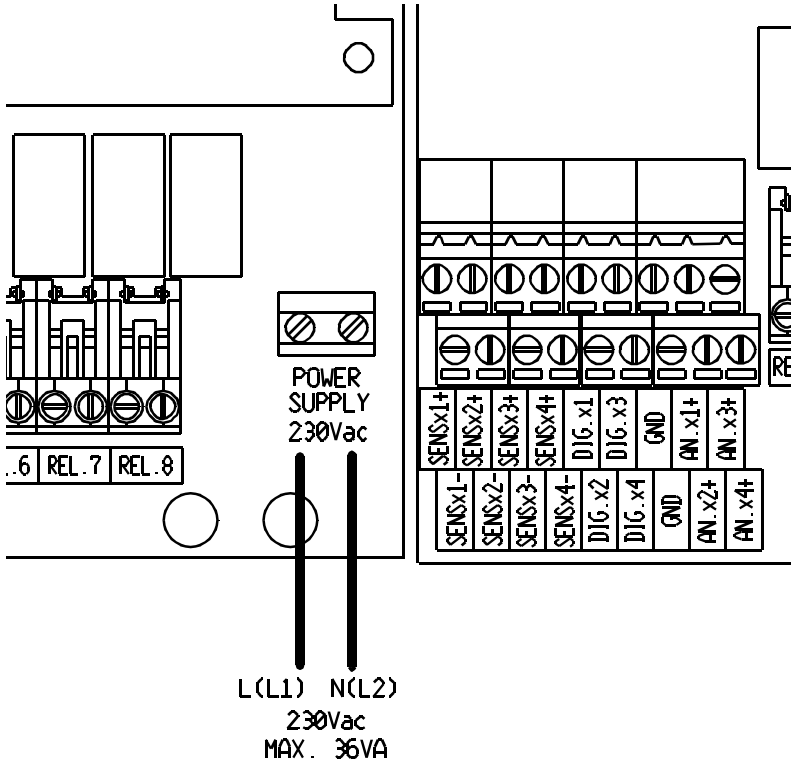


Connections weight converter

1			= loadcel 1+2 red
2			= loadcel 1+2 green
3			= loadcel 1+2 white
4			= loadcel 11+2 black
5			= loadcel 1 shielding
6			= loadcel 2 shielding
7			= + signal 0-10V to Navigator
8	+	10	= - signal 0-10V to Navigator
9	+	11	= 24Vac power supply, max. 5VA

***Remark**: In the wiring diagram the 0-10V weight signal of the weight converter is connected to the analog input 4 of the Navigator. This of course can be every analog input of your own choice.*

Wiring diagram power supply.



L = phase 230Vac
N = zero
Maximum power consumption: 36VA

Note: *do not connect to earth. Ensure that the shielding of the various sensor connections are NOT connected to earth, but to the terminals as indicated in the corresponding wiring diagrams.*

Specifications.

Power supply	230Vac
Admissible voltage fluctuations	-10% / +5%
Mains frequency	50/60 Hz.
Measuring accuracy temperature	0.1 C
Resolution temperature readout	0.1C
Voltage measurement	0 - 10V
Measuring accuracy voltage	2.5 mV
Digital inputs	pull up resistance 470 ohm to +5V
Max. impedance connectable analog output (in mA position)	500 ohm
Output impedance analog output (in Volt position)	500 ohm
Relay (also alarm relay)	max. 24Vac/dc max. 2 Amp.
Number of additional extension boards	max. 3
Power supply for external sensors (e.g. humidity sensors)	+24V max. 200mA
Number of P-controls	20
Number of on/off controls	20
Number of light controls	2
Number of feed controls	2
Number of water controls	2
Number of additional timer controls	2
Number of humidity controls	1
Number of wind controls	1
Number of stage ventilation controls	2
Number of circulation controls	2
Number of general temperature curves	4

Extension boards	**basis**	**+1**	**+2**	**+3**
Number of temperature inputs / 0-10V inputs	9	13	17	21
Number of relays	8	12	16	20
Alarm relays	1	1	1	1
Analog outputs (4-20mA or 0-10V)	8	12	16	20
Digital inputs	8	12	16	20

Lists for completion installation settings.

The following pages include a number of lists that will have to be completed by the installer. The lists for completion apply to the assignments of the various controls. sensors aso. If, for one reason or the other, the installation settings must be set again, the right data will be at hand.

List for completion general settings.

General settings	default	user
Language setting	0	
Dead zone wind direction	20	
Hysteresis wind direction	10	
Delay time wind direction	0:15 H:M	
Litres/pulse water metering system 1	1.00 ltrs	
Litres/pulse water metering system 2	1.00 ltrs	
Kg/pulse feeding system 1	10,00 Kg	
Kg/pulse feeding system 2	10,00 Kg	
Reset offset start new batch	OFF	
Fahrenheit readout	OFF	
DWS-20 for birds 1	OFF	
DWS-20 for birds 2	OFF	
Computer ID	0	
Range pressure sensor	100 Pa	

List for completion available functions.

Available functions	default	user	Available functions	default	user
Overall picture	ON				
Bird menu 1	ON				
Bird menu 2	ON				
P-control 1	ON		On/off control 1	ON	
P-control 2	ON		On/off control 2	ON	
P-control 3	OFF		On/off control 3	OFF	
P-control 4	OFF		On/off control 4	OFF	
P-control 5	OFF		On/off control 5	OFF	
P-control 6	OFF		On/off control 6	OFF	
P-control 7	OFF		On/off control 7	OFF	
P-control 8	OFF		On/off control 8	OFF	
P-control 9	OFF		On/off control 9	OFF	
P-control 10	OFF		On/off control 10	OFF	
P-control 11	OFF		On/off control 11	OFF	
P-control 12	OFF		On/off control 12	OFF	
P-control 13	OFF		On/off control 13	OFF	
P-control 14	OFF		On/off control 14	OFF	
P-control 15	OFF		On/off control 15	OFF	
P-control 16	OFF		On/off control 16	OFF	
P-control 17	OFF		On/off control 17	OFF	
P-control 18	OFF		On/off control 18	OFF	
P-control 19	OFF		On/off control 19	OFF	
P-control 20	OFF		On/off control 20	OFF	
Feeding system 1	ON		Feeding system 2	OFF	
Water metering system 1	ON		Water metering system 2	OFF	
Lighting system 1	ON		Lighting system 2	OFF	
Additional timer control 1	OFF		Additional timer control 2	OFF	
Humidity control	ON		CO2 control	OFF	
Wind control	OFF		Temperatuur curve 1	ON	
Temperature curve 2	ON		Temperature curve 3	ON	
Temperature curve 4	ON		Circulation control 1	OFF	
Circulation control 2	OFF		Boiler control	OFF	
Stage ventilation 1	OFF		Stage ventilation 2	OFF	
Feed weigher	OFF		Pressure control	OFF	

List for completion sensor selection.

Sensor selection	default	user
Sensor 1 (SENS.1+ / 1-)	TEMP	
Sensor 2 (SENS.2+ / 2-)	TEMP	
Sensor 3 (SENS.3+ / 3-)	TEMP	
Sensor 4 (SENS.4+ / 4-)	TEMP	
Sensor 5 (SENS.5+ / 5-)	TEMP	
Sensor 6 (SENS.6+ / 6-)	VOLT	
Sensor 7 (SENS.7+ / 7-)	VOLT	
Sensor 8 (SENS.8+ / 8-)	NO	
Sensor 9 (SENS.9+ / 9-)	NO	
Sensor A-1 (SENS.A1+ / A1-)	NO	
Sensor A-2 (SENS.A2+ / A2-)	NO	
Sensor A-3 (SENS.A3+ / A3-)	NO	
Sensor A-4 (SENS.A4+ / A4-)	NO	
Sensor B-1 (SENS.B1+ / B1-)	NO	
Sensor B-2 (SENS.B2+ / B2-)	NO	
Sensor B-3 (SENS.B3+ / B3-)	NO	
Sensor B-4 (SENS.B4+ / B4-)	NO	
Sensor C-1 (SENS.C1+ / C1-)	NO	
Sensor C-2 (SENS.C2+ / C2-)	NO	
Sensor C-3 (SENS.C3+ / C3-)	NO	
Sensor C-4 (SENS.C4+ / C4-)	NO	

List for completion assignment sensors.

Assignment sensors	default	user	Assignment sensors	default	user
Sensor outdoor	SENS.1				
Sensor P-control 1	SENS.2		Sensor on/off 1	SENS.2	
Sensor P-control 1	SENS.3		Sensor on/off 1	SENS.3	
Sensor P-control 1	SENS.4		Sensor on/off 1	SENS.4	
Sensor P-control 1	SENS.5		Sensor on/off 1	SENS.5	
Sensor P-control 2	SENS.2		Sensor on/off 2	SENS.2	
Sensor P-control 2	SENS.3		Sensor on/off 2	SENS.3	
Sensor P-control 2	SENS.4		Sensor on/off 2	SENS.4	
Sensor P-control 2	SENS.5		Sensor on/off 2	SENS.5	
Sensor P-control 3	NO		Sensor on/off 3	NO	
Sensor P-control 3	NO		Sensor on/off 3	NO	
Sensor P-control 3	NO		Sensor on/off 3	NO	
Sensor P-control 3	NO		Sensor on/off 3	NO	
Sensor P-control 4	NO		Sensor on/off 4	NO	
Sensor P-control 4	NO		Sensor on/off 4	NO	
Sensor P-control 4	NO		Sensor on/off 4	NO	
Sensor P-control 4	NO		Sensor on/off 4	NO	
Sensor P-control 5	NO		Sensor on/off 5	NO	
Sensor P-control 5	NO		Sensor on/off 5	NO	
Sensor P-control 5	NO		Sensor on/off 5	NO	
Sensor P-control 5	NO		Sensor on/off 5	NO	
Sensor P-control 6	NO		Sensor on/off 6	NO	
Sensor P-control 6	NO		Sensor on/off 6	NO	
Sensor P-control 6	NO		Sensor on/off 6	NO	
Sensor P-control 6	NO		Sensor on/off 6	NO	
Sensor P-control 7	NO		Sensor on/off 7	NO	
Sensor P-control 7	NO		Sensor on/off 7	NO	
Sensor P-control 7	NO		Sensor on/off 7	NO	
Sensor P-control 7	NO		Sensor on/off 7	NO	
Sensor P-control 8	NO		Sensor on/off 8	NO	
Sensor P-control 8	NO		Sensor on/off 8	NO	
Sensor P-regeling 8	NO		Sensor on/off 8	NO	
Sensor P-control 8	NO		Sensor on/off 8	NO	

Sensor P-control 9	NO		Sensor on/off 9	NO	
Sensor P-control 9	NO		Sensor on/off 9	NO	
Sensor P-control 9	NO		Sensor on/off 9	NO	
Sensor P-control 9	NO		Sensor on/off 9	NO	
Sensor P-control 10	NO		Sensor on/off 10	NO	
Sensor P-control 10	NO		Sensor on/off 10	NO	
Sensor P-control 10	NO		Sensor on/off 10	NO	
Sensor P-control 10	NO		Sensor on/off 10	NO	
Sensor P-control 11	NO		Sensor on/off 11	NO	
Sensor P-control 11	NO		Sensor on/off 11	NO	
Sensor P-control 11	NO		Sensor on/off 11	NO	
Sensor P-control 11	NO		Sensor on/off 11	NO	
Sensor P-control 12	NO		Sensor on/off 12	NO	
Sensor P-control 12	NO		Sensor on/off 12	NO	
Sensor P-control 12	NO		Sensor on/off 12	NO	
Sensor P-control 12	NO		Sensor on/off 12	NO	
Sensor P-control 13	NO		Sensor on/off 13	NO	
Sensor P-control 13	NO		Sensor on/off 13	NO	
Sensor P-control 13	NO		Sensor on/off 13	NO	
Sensor P-control 13	NO		Sensor on/off 13	NO	
Sensor P-control 14	NO		Sensor on/off 14	NO	
Sensor P-control 14	NO		Sensor on/off 14	NO	
Sensor P-control 14	NO		Sensor on/off 14	NO	
Sensor P-control 14	NO		Sensor on/off 14	NO	
Sensor P-control 15	NO		Sensor on/off 15	NO	
Sensor P-control 15	NO		Sensor on/off 15	NO	
Sensor P-control 15	NO		Sensor on/off 15	NO	
Sensor P-control 15	NO		Sensor on/off 15	NO	
Sensor P-control 16	NO		Sensor on/off 16	NO	
Sensor P-control 16	NO		Sensor on/off 16	NO	
Sensor P-control 16	NO		Sensor on/off 16	NO	
Sensor P-control 16	NO		Sensor on/off 16	NO	
Sensor P-control 17	NO		Sensor on/off 17	NO	
Sensor P-control 17	NO		Sensor on/off 17	NO	
Sensor P-control 17	NO		Sensor on/off 17	NO	
Sensor P-control 17	NO		Sensor on/off 17	NO	

Sensor P-control 18	NO		Sensor on/off 18	NO	
Sensor P-control 18	NO		Sensor on/off 18	NO	
Sensor P-control 18	NO		Sensor on/off 18	NO	
Sensor P-control 18	NO		Sensor on/off 18	NO	
Sensor P-control 19	NO		Sensor on/off 19	NO	
Sensor P-control 19	NO		Sensor on/off 19	NO	
Sensor P-control 19	NO		Sensor on/off 19	NO	
Sensor P-control 19	NO		Sensor on/off 19	NO	
Sensor P-control 20	NO		Sensor on/off 20	NO	
Sensor P-control 20	NO		Sensor on/off 20	NO	
Sensor P-control 20	NO		Sensor on/off 20	NO	
Sensor P-control 20	NO		Sensor on/off 20	NO	
Humidity sensor indoor	SENS.6		Humidity sensor outdoor	SENS.7	
Sensor T indoor	SENS.2		Sensor T indoor	SENS.2	
Sensor T indoor	SENS.2		Sensor T indoor	SENS.2	
Sensor CO2	NO		Sensor wind direction	NO	
Sensor circulation 1	NO		Sensor circulation 2	NO	
Sensor circulation 1	NO		Sensor circulation 2	NO	
Sensor circulation 1	NO		Sensor circulation 2	NO	
Sensor circulation 1	NO		Sensor circulation 2	NO	
Sensor boiler heating unit	NO		Sensor feed weigher	NO	
Sensor pressure control	NO				

List for completion mode analog outputs.

Mode analog outputs	default	user
Output 1 (AN.GND / AN.1+)	4-20 mA	
Output 2 (AN.GND / AN.2+)	4-20 mA	
Output 3 (AN.GND / AN.3+)	4-20 mA	
Output 4 (AN.GND / AN.4+)	4-20 mA	
Output 5 (AN.GND / AN.5+)	4-20 mA	
Output 6 (AN.GND / AN.6+)	4-20 mA	
Output 7 (AN.GND / AN.7+)	4-20 mA	
Output 8 (AN.GND / AN.8+)	4-20 mA	
Output A-1 (GND / AN.A1+)	4-20 mA	
Output A-2 (GND / AN.A2+)	4-20 mA	
Output A-3 (GND / AN.A3+)	4-20 mA	
Output A-4 (GND / AN.A4+)	4-20 mA	
Output B-1 (GND / AN.B1+)	4-20 mA	
Output B-2 (GND / AN.B2+)	4-20 mA	
Output B-3 (GND / AN.B3+)	4-20 mA	
Output B-4 (GND / AN.B4+)	4-20 mA	
Output C-1 (GND / AN.C1+)	4-20 mA	
Output C-2 (GND / AN.C2+)	4-20 mA	
Output C-3 (GND / AN.C3+)	4-20 mA	
Output C-4 (GND / AN.C4+)	4-20 mA	

List for completion mode p-controls.

Mode p-controls	default	user
P-control 1	COOLING	
P-control 2	COOLING	
P-control 3	COOLING	
P-control 4	COOLING	
P-control 5	COOLING	
P-control 6	COOLING	
P-control 7	COOLING	
P-control 8	COOLING	
P-control 9	COOLING	
P-control 10	COOLING	
P-control 11	COOLING	
P-control 12	COOLING	
P-control 13	COOLING	
P-control 14	COOLING	
P-control 15	COOLING	
P-control 16	COOLING	
P-control 17	COOLING	
P-control 18	COOLING	
P-control 19	COOLING	
P-control 20	COOLING	

List for completion assignment analog outputs.

Assignment analog outputs	default	user	Assignment analog outputs	default	user
P-control 1	AN.1		P-control 11	NO	
P-control 1	NO		P-control 11	NO	
P-control 1	NO		P-control 11	NO	
P-control 1	NO		P-control 11	NO	
P-control 2	AN.2		P-control 12	NO	
P-control 2	NO		P-control 12	NO	
P-control 2	NO		P-control 12	NO	
P-control 2	NO		P-control 12	NO	
P-control 3	NO		P-control 13	NO	
P-control 3	NO		P-control 13	NO	
P-control 3	NO		P-control 13	NO	
P-control 3	NO		P-control 13	NO	
P-control 4	NO		P-control 14	NO	
P-control 4	NO		P-control 14	NO	
P-control 4	NO		P-control 14	NO	
P-control 4	NO		P-control 14	NO	
P-control 5	NO		P-control 15	NO	
P-control 5	NO		P-control 15	NO	
P-control 5	NO		P-control 15	NO	
P-control 5	NO		P-control 15	NO	
P-control 6	NO		P-control 16	NO	
P-control 6	NO		P-control 16	NO	
P-control 6	NO		P-control 16	NO	
P-control 6	NO		P-control 16	NO	
P-control 7	NO		P-control 17	NO	
P-control 7	NO		P-control 17	NO	
P-control 7	NO		P-control 17	NO	
P-control 7	NO		P-control 17	NO	
P-control 8	NO		P-control 18	NO	
P-control 8	NO		P-control 18	NO	
P-control 8	NO		P-control 18	NO	
P-control 8	NO		P-control 18	NO	
P-control 9	NO		P-control 19	NO	

P-control 9	NO		P-control 19	NO	
P-control 9	NO		P-control 19	NO	
P-control 9	NO		P-control 19	NO	
P-control 10	NO		P-control 20	NO	
P-control 10	NO		P-control 20	NO	
P-control 10	NO		P-control 20	NO	
P-control 10	NO		P-control 20	NO	
Lighting system 1	NO		Lighting system 2	NO	
Lighting system 1	NO		Lighting system 2	NO	
Lighting system 1	NO		Lighting system 2	NO	
Lighting system 1	NO		Lighting system 2	NO	
Circulation control 1	NO		Circulation control 2	NO	
Circulation control 1	NO		Circulation control 2	NO	
Circulation control 1	NO		Circulation control 2	NO	
Circulation control 1	NO		Circulation control 2	NO	
Stage ventilation 1	NO		Stage ventilation 2	NO	
Stage ventilation 1	NO		Stage ventilation 2	NO	
Stage ventilation 1	NO		Stage ventilation 2	NO	
Stage ventilation 1	NO		Stage ventilation 2	NO	

List for completion assignment relays.

Assignment relay	default	user	Assignment relay	default	user
On/off control 1	REL.1		On/off control 11	NO	
On/off control 2	REL.2		On/off control 12	NO	
On/off control 3	NO		On/off control 13	NO	
On/off control 4	NO		On/off control 14	NO	
On/off control 5	NO		On/off control 15	NO	
On/off control 6	NO		On/off control 16	NO	
On/off control 7	NO		On/off control 17	NO	
On/off control 8	NO		On/off control 18	NO	
On/off control 9	NO		On/off control 19	NO	
On/off control 10	NO		On/off control 20	NO	
Feeding system 1	REL.3		Feeding system 2	NO	
Water metering system 1	REL.4		Water metering system 2	NO	
Lighting system 1	REL.5		Light delay 1	NO	
Lighting system 2	NO		Light delay 2	NO	
Additional timer control 1	NO		Additional timer control 2	NO	
Humidity control	NO		Boiler control 1	NO	
Boiler control 2	NO		Boiler control 3	NO	
Stage ventilation 1 (st.1)	NO		Stage ventilation 2 (st.1)	NO	
Stage ventilation 1 (st.2)	NO		Stage ventilation 2 (st.2)	NO	
Stage ventilation 1 (st.3)	NO		Stage ventilation 2 (st.3)	NO	
Stage ventilation 1 (st.4)	NO		Stage ventilation 2 (st.4)	NO	
Stage ventilation 1 (st.5)	NO		Stage ventilation 2 (st.5)	NO	
Stage ventilation 1 (st.6)	NO		Stage ventilation 2 (st.6)	NO	
Auger of silo 1	NO		Auger of silo 2	NO	
Auger of silo 3	NO		Auger of silo 4	NO	
Feed mixer	NO		Feed transport circuit 1	NO	
Feed transport circuit 2	NO		Feed transport circuit 3	NO	
Feed transport circuit 4	NO		Feed transport circuit 5	NO	
Feed transport circuit 6	NO		feed valve	NO	

List for completion analog pwm control relay.

Analog pwm control relay	default	user	Analog pwm control relay	default	user
Operation time relay 1	1:00 M:S		Min. on/off time relay 1	0:10 M:S	
Operation time relay 2	1:00 M:S		Min. on/off time relay 2	0:10 M:S	
Operation time relay 3	1:00 M:S		Min. on/off time relay 3	0:10 M:S	
Operation time relay 4	1:00 M:S		Min. on/off time relay 4	0:10 M:S	
Operation time relay 5	1:00 M:S		Min. on/off time relay 5	0:10 M:S	
Operation time relay 6	1:00 M:S		Min. on/off time relay 6	0:10 M:S	
Operation time relay 7	1:00 M:S		Min. on/off time relay 7	0:10 M:S	
Operation time relay 8	1:00 M:S		Min. on/off time relay 8	0:10 M:S	
Operation time relay 9	1:00 M:S		Min. on/off time relay 9	0:10 M:S	
Operation time relay 10	1:00 M:S		Min. on/off time relay 10	0:10 M:S	
Operation time relay 11	1:00 M:S		Min. on/off time relay 11	0:10 M:S	
Operation time relay 12	1:00 M:S		Min. on/off time relay 12	0:10 M:S	
Operation time relay 13	1:00 M:S		Min. on/off time relay 13	0:10 M:S	
Operation time relay 14	1:00 M:S		Min. on/off time relay 14	0:10 M:S	
Operation time relay 15	1:00 M:S		Min. on/off time relay 15	0:10 M:S	
Operation time relay 16	1:00 M:S		Min. on/off time relay 16	0:10 M:S	
Operation time relay 17	1:00 M:S		Min. on/off time relay 17	0:10 M:S	
Operation time relay 18	1:00 M:S		Min. on/off time relay 18	0:10 M:S	
Operation time relay 19	1:00 M:S		Min. on/off time relay 19	0:10 M:S	
Operation time relay 20	1:00 M:S		Min. on/off time relay 20	0:10 M:S	

List for completion assignment digital inputs.

Assignment digital inputs	default	user	Assignment digital inputs	default	user
Feeding system 1	DIG.1		Feeding system 2	NO	
Water metering system 1	DIG.2		Water metering system 2	NO	
Wind speed	NO		Empty sensor weigher	NO	
Empty sensor transport 1	NO		Empty sensor transport 2	NO	
Empty sensor transport 3	NO		Empty sensor transport 4	NO	
Empty sensor transport 5	NO		Empty sensor transport 6	NO	

List for completion control names.

Names controls	default	user	Names controls	default	user
Name p-control 1	P-CTRL1		Name on/off control 1	ON/OFF1	
Name p-control 2	P-CTRL2		Name on/off control 2	ON/OFF2	
Name p-control 3	P-CTRL3		Name on/off control 3	ON/OFF3	
Name p-control 4	P-CTRL4		Name on/off control 4	ON/OFF4	
Name p-control 5	P-CTRL5		Name on/off control 5	ON/OFF5	
Name p-control 6	P-CTRL6		Name on/off control 6	ON/OFF6	
Name p-control 7	P-CTRL7		Name on/off control 7	ON/OFF7	
Name p-control 8	P-CTRL8		Name on/off control 8	ON/OFF8	
Name p-control 9	P-CTRL9		Name on/off control 9	ON/OFF9	
Name p-control 10	P-CTRL10		Name on/off control 10	ON/OFF10	
Name p-control 11	P-CTRL11		Name on/off control 11	ON/OFF11	
Name p-control 12	P-CTRL12		Name on/off control 12	ON/OFF12	
Name p-control 13	P-CTRL13		Name on/off control 13	ON/OFF13	
Name p-control 14	P-CTRL14		Name on/off control 14	ON/OFF14	
Name p-control 15	P-CTRL15		Name on/off control 15	ON/OFF15	
Name p-control 16	P-CTRL16		Name on/off control 16	ON/OFF16	
Name p-control 17	P-CTRL17		Name on/off control 17	ON/OFF17	
Name p-control 18	P-CTRL18		Name on/off control 18	ON/OFF18	
Name p-control 19	P-CTRL19		Name on/off control 19	ON/OFF19	
Name p-control 20	P-CTRL20		Name on/off control 20	ON/OFF20	
Name temp. curve 1	1		Name temp. curve 2	2	
Name temp. curve 3	3		Name temp. curve 4	4	
Name stage ventilation 1	STAGEV.1		Name stage ventilation 2	STAGEV.2	
Name circulation 1	CIRC.1		Name circulation 2	CIRC.2	
Name additional timer 1	TIMER 1		Name additional timer 2	TIMER 2	
Name light control 1	LIGHT 1		Name light control 2	LIGHT 2	
Name water system 1	WATER 1		Name water system 2	WATER 2	
Name feeding system 1	FEED 1		Name feeding system 2	FEED 2	

List for completion settings M3 stage ventilation.

Settings M3 stage ventilation	default	user	Settings M3 stage ventilation	default	user
M3 var.group stage vent.1	10000 M3		M3 var.group stage vent.2	10000 M3	
M3 group 1 stage vent.1	10000 M3		M3 group 2 stage vent.1	10000 M3	
M3 group 1 stage vent.2	10000 M3		M3 group 2 stage vent.2	10000 M3	
M3 group 1 stage vent.3	10000 M3		M3 group 2 stage vent.3	10000 M3	
M3 group 1 stage vent.4	10000 M3		M3 group 2 stage vent.4	10000 M3	
M3 group 1 stage vent.5	10000 M3		M3 group 2 stage vent.5	10000 M3	
M3 group 1 stage vent.6	10000 M3		M3 group 2 stage vent.6	10000 M3	
Delay time grp.1 st.vent.1	0:00 M:S		Delay time grp.2 st.vent.1	0:00 M:S	
Delay time grp.1 st.vent.2	0:00 M:S		Delay time grp.2 st.vent.2	0:00 M:S	
Delay time grp.1 st.vent.3	0:00 M:S		Delay time grp.2 st.vent.3	0:00 M:S	
Delay time grp.1 st.vent.4	0:00 M:S		Delay time grp.2 st.vent.4	0:00 M:S	
Delay time grp.1 st.vent.5	0:00 M:S		Delay time grp.2 st.vent.5	0:00 M:S	
Delay time grp.1 st.vent.6	0:00 M:S		Delay time grp.2 st.vent.6	0:00 M:S	

List for completion settings analog output 1.

settings ana. output 1	default	user	settings ana. output 1	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 2.

settings ana. output 2	default	user	settings ana. output 2	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 3.

settings ana. output 3	default	user	settings ana. output 3	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 4.

settings ana. output 4	default	user	settings ana. output 4	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 5.

settings ana. output 5	default	user	settings ana. output 5	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 6.

settings ana. output 6	default	user	settings ana. output 6	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 7.

settings ana. output 7	default	user	settings ana. output 7	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 8.

settings ana. output 8	default	user	settings ana. output 8	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 9.

settings ana. output 9	default	user	settings ana. output 9	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 10.

settings ana. output 10	default	user	settings ana. output 10	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 11.

settings ana. output 11	default	user	settings ana. output 11	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 12.

settings ana. output 12	default	user	settings ana. output 12	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 13.

settings ana. output 13	default	user	settings ana. output 13	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 14.

settings ana. output 14	default	user	settings ana. output 14	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 15.

settings ana. output 15	default	user	settings ana. output 15	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 16.

settings ana. output 16	default	user	settings ana. output 16	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 17.

settings ana. output 17	default	user	settings ana. output 17	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 18.

settings ana. output 18	default	user	settings ana. output 18	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 19.

settings ana. output 19	default	user	settings ana. output 19	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings analog output 20

settings ana. output 20	default	user	settings ana. output 20	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings input stage ventilation 1.

settings input stage ventilation 1	default	user	settings input stage ventilation 1	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion settings input stage ventilation 2.

settings input stage ventilation 2	default	user	settings input stage ventilation 2	default	user
Control at break 0 (=0%)	0 %				
Input at break 1	10 %		Control at break 1	10%	
Input at break 2	20 %		Control at break 2	20 %	
Input at break 3	30 %		Control at break 3	30 %	
Input at break 4	40 %		Control at break 4	40 %	
Input at break 5	50 %		Control at break 5	50 %	
Input at break 6	60 %		Control at break 6	60 %	
Input at break 7	70 %		Control at break 7	70 %	
Input at break 8	80 %		Control at break 8	80 %	
			Control at break 9 (=100%)	100 %	

List for completion acoustic alarm signalling.

acoustic alarm signalling	default	user	acoustic alarm signalling	default	user
Sensor 1 defective	ON		Sensor 2 defective	ON	
Sensor 3 defective	ON		Sensor 4 defective	ON	
Sensor 5 defective	ON		Sensor 6 defective	ON	
Sensor 7 defective	ON		Sensor 8 defective	ON	
Sensor 9 defective	ON		Sensor 10 defective	ON	
Sensor 11 defective	ON		Sensor 12 defective	ON	
Sensor 13 defective	ON		Sensor 14 defective	ON	
Sensor 15 defective	ON		Sensor 16 defective	ON	
Sensor 17 defective	ON		Sensor 18 defective	ON	
Sensor 19 defective	ON		Sensor 20 defective	ON	
Sensor 21 defective	ON		Min. rel. alarm p-ctrl.1	ON	
Max. rel. alarm p-ctrl.1	ON		Max. abs. alarm p-ctrl.1	ON	
Min. rel. alarm p-ctrl.2	ON		Max. rel. alarm p-ctrl.2	ON	
Max. abs. alarm p-ctrl.2	ON		Min. rel. alarm p-ctrl.3	ON	
Max. rel. alarm p-ctrl..3	ON		Max. abs. alarm p-ctrl.3	ON	
Min. rel. alarm p-ctrl.4	ON		Max. rel. alarm p-ctrl.4	ON	
Max. abs. alarm p-ctrl.4	ON		Min. rel. alarm p-ctrl.5	ON	

Max. rel. alarm p-ctrl.5	ON		Max. abs. alarm p-ctrl.5	ON	
Min. rel. alarm p-ctrl.6	ON		Max. rel. alarm p-ctrl.6	ON	
Max. abs. alarm p-ctrl.6	ON		Min. rel. alarm p-ctrl.7	ON	
Max. rel. alarm p-ctrl.7	ON		Max. abs. alarm p-ctrl.7	ON	
Min. rel. alarm p-ctrl.8	ON		Max. rel. alarm p-ctrl.8	ON	
Max. abs. alarm p-ctrl.8	ON		Min. rel. alarm p-ctrl.9	ON	
Max. rel. alarm p-ctrl.9	ON		Max. abs. alarm p-ctrl.9	ON	
Min. rel. alarm p-ctrl.10	ON		Max. rel. alarm p-ctrl.10	ON	
Max. abs. alarm p-ctrl.10	ON		Min. rel. alarm p-ctrl.11	ON	
Max. rel. alarm p-ctrl.11	ON		Max. abs. alarm p-ctrl.11	ON	
Min. rel. alarm p-ctrl.12	ON		Max. rel. alarm p-ctrl.12	ON	
Max. abs. alarm p-ctrl.12	ON		Min. rel. alarm p-ctrl.13	ON	
Max. rel. alarm p-ctrl.13	ON		Max. abs. alarm p-ctrl.13	ON	
Min. rel. alarm p-ctrl.14	ON		Max. rel. alarm p-ctrl.14	ON	
Max. abs. alarm p-ctrl.14	ON		Min. rel. alarm p-ctrl.15	ON	
Max. rel. alarm p-ctrl.15	ON		Max. abs. alarm p-ctrl.15	ON	
Min. rel. alarm p-ctrl.16	ON		Max. rel. alarm p-ctrl.16	ON	
Max. abs. alarm p-ctrl.16	ON		Min. rel. alarm p-ctrl.17	ON	
Max. rel. alarm p-ctrl.17	ON		Max. abs. alarm p-ctrl.17	ON	
Min. rel. alarm p-ctrl.18	ON		Max. rel. alarm p-ctrl.18	ON	
Max. abs. alarm p-ctrl.18	ON		Min. rel. alarm p-ctrl.19	ON	
Max. rel. alarm p-ctrl.19	ON		Max. abs. alarm p-ctrl.19	ON	
Min. rel. alarm p-ctrl.20	ON		Max. rel. alarm p-ctrl.20	ON	
Max. abs. alarm p-ctrl.20	ON		Min. rel. alarm on-off 1	ON	
Max. rel. alarm on-off 1	ON		Max. abs. alarm on-off 1	ON	
Min. rel. alarm on-off 2	ON		Max. rel. alarm on-off 2	ON	
Max. abs. alarm on-off 2	ON		Min. rel. alarm on-off 3	ON	
Max. rel. alarm on-off 3	ON		Max. abs. alarm on-off 3	ON	
Min. rel. alarm on-off 4	ON		Max. rel. alarm on-off 4	ON	
Max. abs. alarm on-off 4	ON		Min. rel. alarm on-off 5	ON	
Max. rel. alarm on-off 5	ON		Max. abs. alarm on-off 5	ON	
Min. rel. alarm on-off 6	ON		Max. rel. alarm on-off 6	ON	
Max. abs. alarm on-off 6	ON		Min. rel. alarm on-off 7	ON	
Max. rel. alarm on-off 7	ON		Max. abs. alarm on-off 7	ON	
Min. rel. alarm on-off 8	ON		Max. rel. alarm on-off 8	ON	
Max. abs. alarm on-off 8	ON		Min. rel. alarm on-off 9	ON	

Max. rel. alarm on-off 9	ON		Max. abs. alarm on-off 9	ON	
Min. rel. alarm on-off 10	ON		Max. rel. alarm on-off 10	ON	
Max.abs.alarm on-off 10	ON		Min. rel. alarm on-off 11	ON	
Max. rel. alarm on-off 11	ON		Max.abs.alarm on-off 11	ON	
Min. rel. alarm on-off 12	ON		Max. rel. alarm on-off 12	ON	
Max.abs.alarm on-off 12	ON		Min. rel. alarm on-off 13	ON	
Max. rel. alarm on-off 13	ON		Max.abs.alarm on-off 13	ON	
Min. rel. alarm on-off 14	ON		Max. rel. alarm on-off 14	ON	
Max.abs.alarm on-off 14	ON		Min. rel. alarm on-off 15	ON	
Max. rel. alarm on-off 15	ON		Max.abs.alarm on-off 15	ON	
Min. rel. alarm on-off 16	ON		Max. rel. alarm on-off 16	ON	
Max.abs.alarm on-off 16	ON		Min. rel. alarm on-off 17	ON	
Max. rel. alarm on-off 17	ON		Max.abs.alarm on-off 17	ON	
Min. rel. alarm on-off 18	ON		Max. rel. alarm on-off 18	ON	
Max.abs.alarm on-off 18	ON		Min. rel. alarm on-off 19	ON	
Max. rel. alarm on-off 19	ON		Max.abs.alarm on-off 19	ON	
Min. rel. alarm on-off 20	ON		Max. rel. alarm on-off 20	ON	
Max.abs.alarm on-off 20	ON		Min.rel.alarm stage v.1	ON	
Max.rel.alarm stage v.1	ON		Max.abs.alarm stage v.1	ON	
Min.rel.alarm stage v.2	ON		Max.rel.alarm stage v.2	ON	
Max.abs.alarm stage v.2	ON		Maximum CO2 alarm	ON	
Feeding system 1	ON		Feeding system 2	ON	
Water system 1	ON		Water system 2	ON	
Min.boiler alarm	ON		Max.boiler alarm	ON	
Max.litres water syst.1	ON		Max.litres water syst.2	ON	
Max.filling time weigher	ON		Min.feed detected	ON	
No feed detected	ON		Minimum pressure	ON	
Maximum pressure	ON				

List for completion heat demand boiler control.

Heat demand boiler control	default	user	Heat demand boiler control	default	user
P-control 1	OFF		On/off control 1	OFF	
P-control 2	OFF		On/off control 2	OFF	
P-control 3	OFF		On/off control 3	OFF	
P-control 4	OFF		On/off control 4	OFF	
P-control 5	OFF		On/off control 5	OFF	
P-control 6	OFF		On/off control 6	OFF	
P-control 7	OFF		On/off control 7	OFF	
P-control 8	OFF		On/off control 8	OFF	
P-control 9	OFF		On/off control 9	OFF	
P-control 10	OFF		On/off control 10	OFF	
P-control 11	OFF		On/off control 11	OFF	
P-control 12	OFF		On/off control 12	OFF	
P-control 13	OFF		On/off control 13	OFF	
P-control 14	OFF		On/off control 14	OFF	
P-control 15	OFF		On/off control 15	OFF	
P-control 16	OFF		On/off control 16	OFF	
P-control 17	OFF		On/off control 17	OFF	
P-control 18	OFF		On/off control 18	OFF	
P-control 19	OFF		On/off control 19	OFF	
P-control 20	OFF		On/off control 20	OFF	

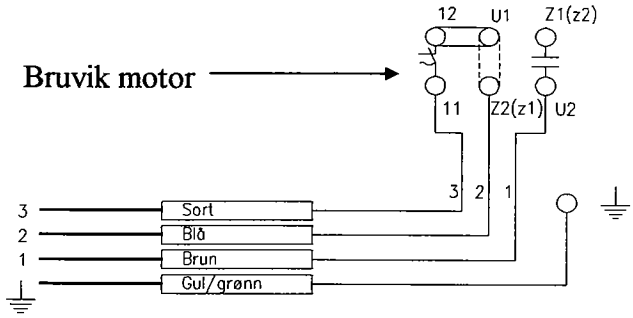
List for completion of feed weigher.

Settings weigher	default	user	Settings weigher	default	user
Minimum calibration	0		Maximum calibration	0	
Calibration weight	5000 gr		Pause stabilize	0:03 M:S	
Pre pause feed valve	0:02 M:S		Active time feed valve	0:05 M:S	
Pause feed valve	0:10 M:S		Mixer active time	0:00 M:S	
Max.weight in weigher	30,0 Kg		Afterrun time transport 1	0:00 M:S	
Afterrun time transport 2	0:00 M:S		Afterrun time transport 3	0:00 M:S	
Afterrun time transport 4	0:00 M:S		Afterrun time transport 5	0:00 M:S	
Afterrun time transport 6	0:00 M:S		Max.time filling weigher	2:00 M:S	
Transport 1 –> Nav.ID	0		Transport 1 –> Nav.circ.	0	

Transport 2 –> Nav.ID	0		Transport 2 –> Nav.circ.	0	
Transport 3 –> Nav.ID	0		Transport 3 –> Nav.circ.	0	
Transport 4 –> Nav.ID	0		Transport 4 –> Nav.circ.	0	
Transport 5 –> Nav.ID	0		Transport 5 –> Nav.circ.	0	
Transport 6 –> Nav.ID	0		Transport 6 –> Nav.circ.	0	

Vifter med ledning

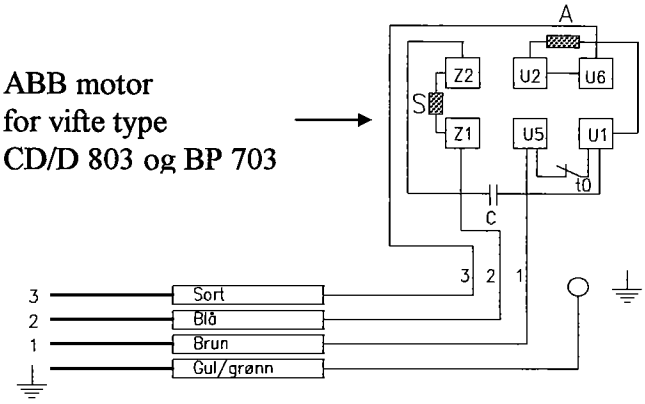
Bruvik motor



Skinne mellom U1 og Z2 er fjernet på Bruvik motorer, når ledninger er montert.

På 1 fase motorer kan motorens omdreiningsretning endres ved å bytte om Z1 og Z2 på koblingsbrettet

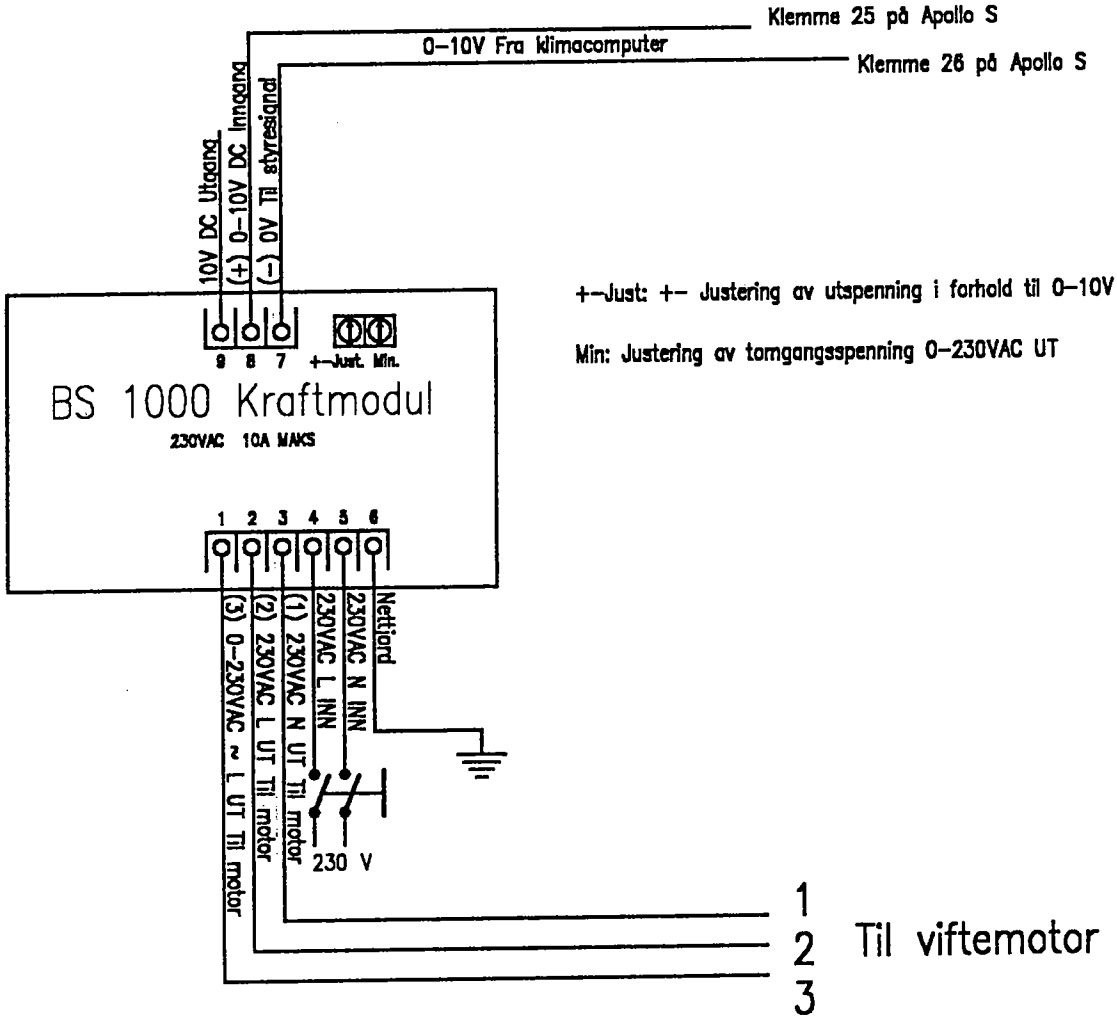
ABB motor
for vifte type
CD/D 803 og BP 703



Vifter som er påmontert ledning fra fabrikk har ledere med farger og kobling som vist på koblingsskjema over. For kobling med 3 leder benyttes 1, 2 og 3. Med 2 leder kobles leder 2 og 3 sammen.

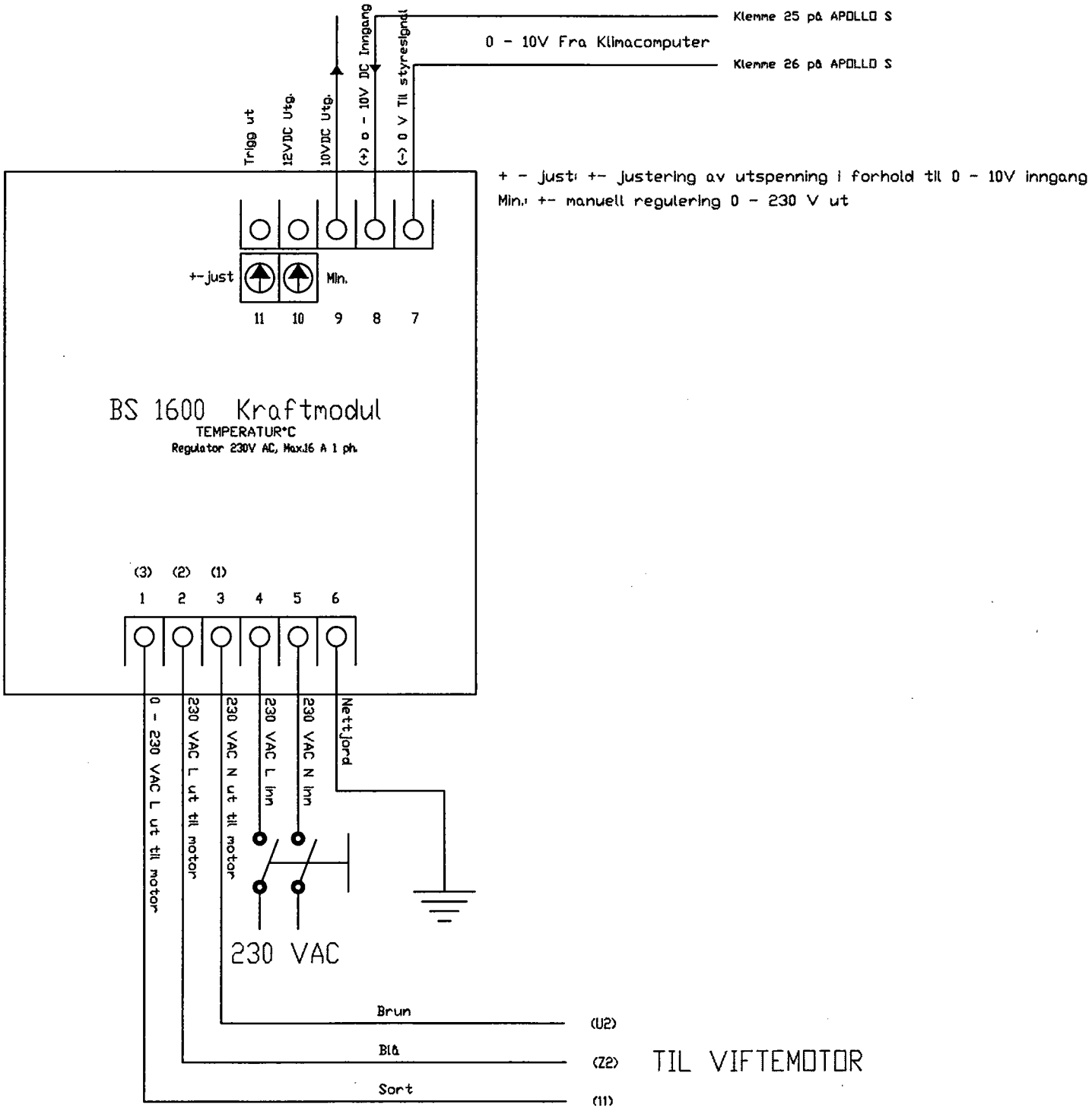
I. Solhaug 10.04.2000

Kobling av BS 1000 Kraftmodul

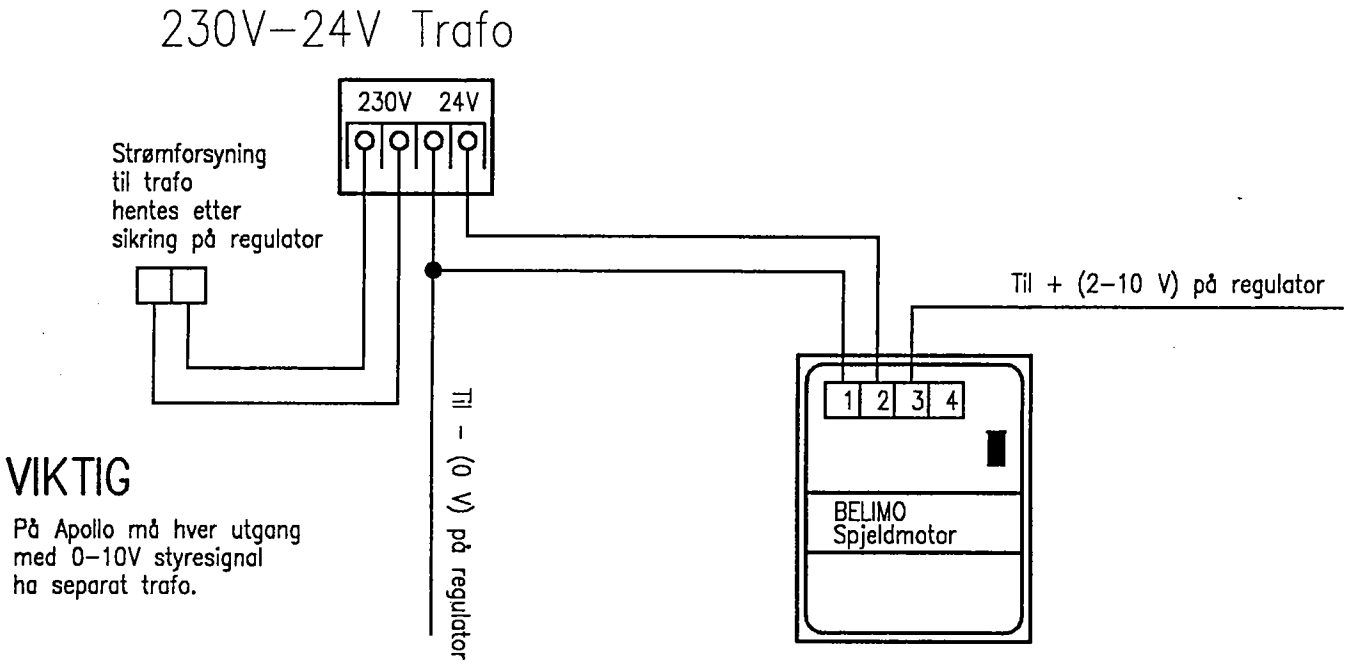


+–Just: +– Justering av utspenning i forhold til 0–10V inngang

Min: Justering av tomgangsspenning 0–230VAC UT

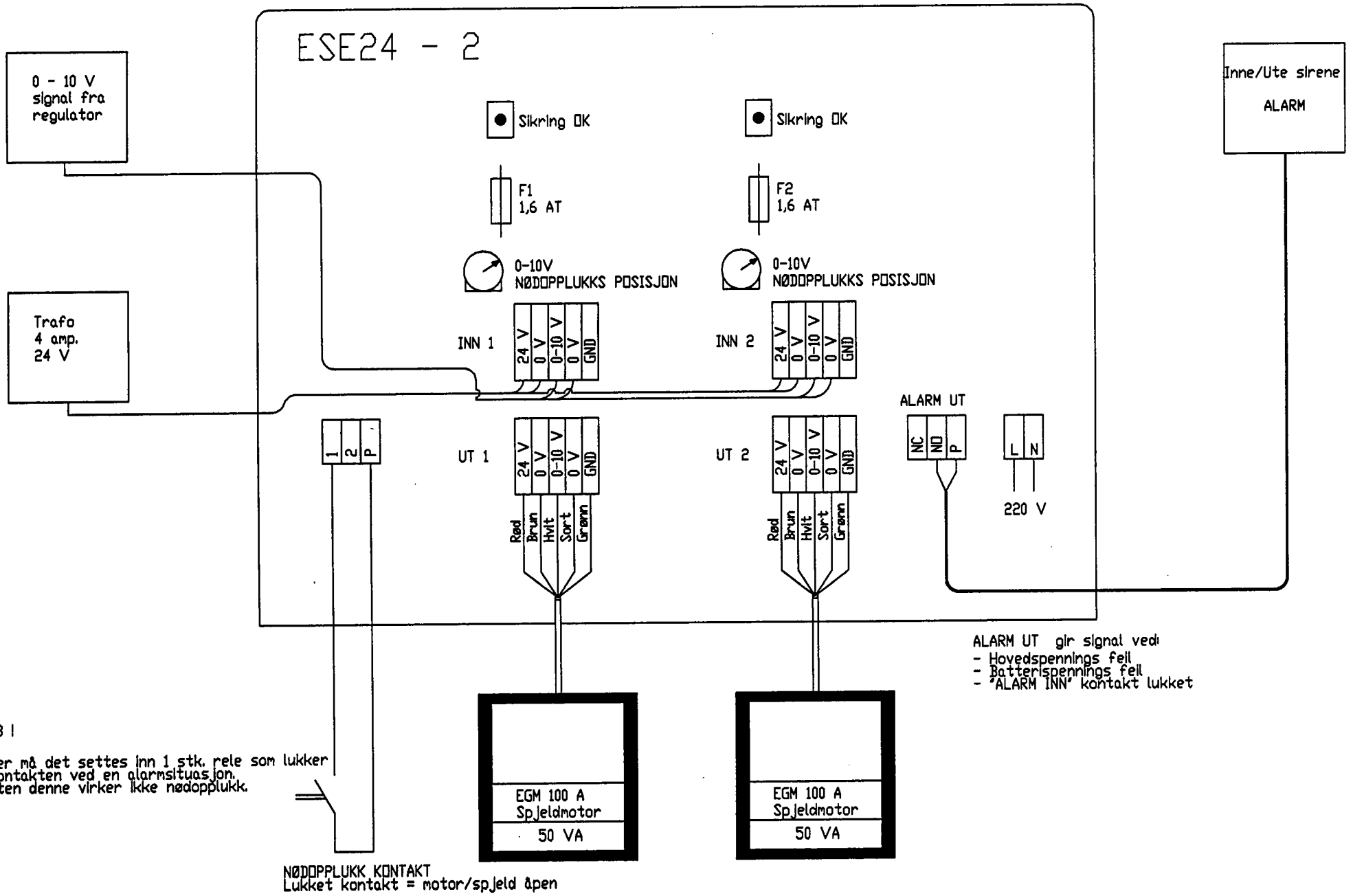

Klemme 25 på APOLLO S
0 - 10V Fra Klimacomputer
Klemme 26 på APOLLO S
Trigg ut
12VDC Utg.
10VDC Utg.
(+) 0 - 10V DC Inngang
(-) 0 V Til styresignal
+ - just: +- justering av utspenning i forhold til 0 - 10V inngang
Min.: +- manuell regulering 0 - 230 V ut
+-just
Min.
11 10 9 8 7
BS 1600 Kraftmodul
TEMPERATUR°C
Regulator 230V AC, Max.16 A 1 ph.
(3) (2) (1)
1 2 3 4 5 6
0 - 230 VAC L ut til motor
230 VAC L ut til motor
230 VAC N ut til motor
230 VAC L inn
230 VAC N inn
Nettjord
230 VAC
Brun
(U2)
Blå
(Z2)
Sort
(11)
TIL VIFTEMOTOR

Kobling av Belimo spjeldmotor



VIKTIG

På Apollo må hver utgang
med 0–10V styresignal
ha separat trafo.


ESE24 - 2
0 - 10 V signal fra regulator
Trafo 4 amp. 24 V
Sikring OK
Sikring OK
F1 1,6 AT
F2 1,6 AT
0-10V NØDOPPLUKKS POSISJON
0-10V NØDOPPLUKKS POSISJON
INN 1
INN 2
24 V
0 V
0-10 V
0 V
GND
1
2
P
UT 1
UT 2
Rød
Brun
Hvit
Svart
Grønn
ALARM UT
NC
NO
P
L
N
220 V
Inne/Ute sirene
ALARM
EGM 100 A Spjeldmotor
50 VA
EGM 100 A Spjeldmotor
50 VA
ALARM UT gir signal ved:
- Hovedspennings feil
- Batterispennings feil
- 'ALARM INN' kontakt lukket
NB !
Her må det settes inn 1 stk. rele som lukker kontakten ved en alarmsituasjon. Uten denne virker ikke nødopplukk.
NØDOPPLUKK KONTAKT
Lukket kontakt = motor/spjeld åpen

RH-200/RH-500

The RH-200/RH-500 is an electronic humidity sensor. It converts the humidity of the air to a voltage. (See illustration 2).

Installation.

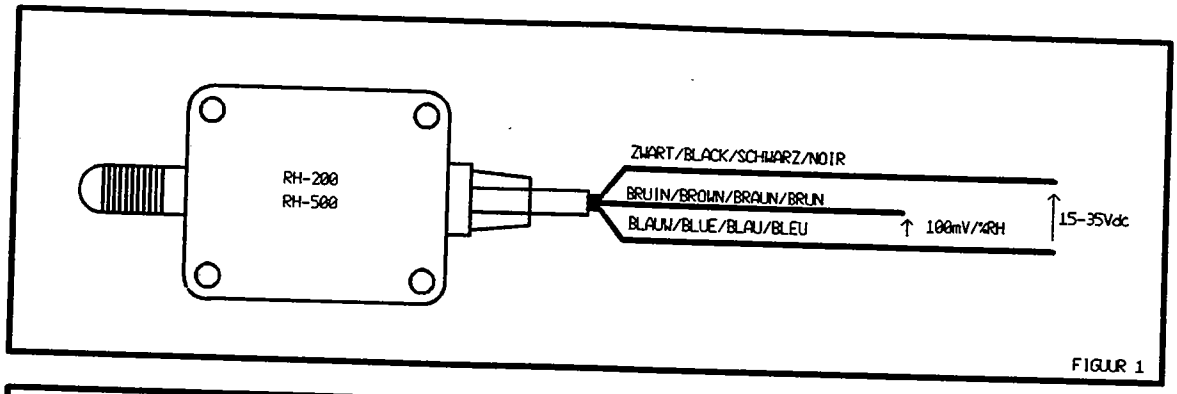
Illustration 1. Supply the sensor with a voltage of 15-35Vdc. + to the black wire, - to the blue wire. The signal voltage is measured between the brown and the blue wire. (0-10Vdc) See illustration 2.

Adjusting.

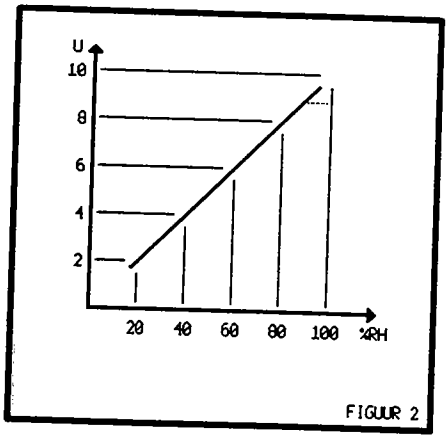
The sensor is adjusted in teh factory with special equipement. If there are no special demands on accuracy, adjusting can be done on the spot after an adequate reference. Adjust the potmeter inside the sensor to obtain the correct output voltage.

Important.

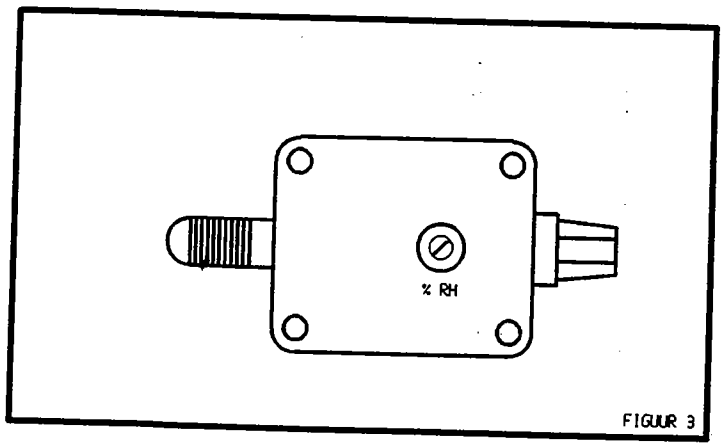
The sensor may not be exposed to dirty water or strong organic dissolvents. Don't touch teh sensor!! Shielding or removal of the sensor is necessary when cleaning with high-pressure cleaner and disinfectants.



FIGUUR 1



FIGUUR 2



FIGUUR 3

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